DEPARTMENTAL COMMITTEE ON AGRICULTURAL EDUCATION IN ENGLAND AND WALES.

REPORT

OF THE

DEPARTMENTAL COMMITTEE

APPOINTED BY THE

BOARD OF AGRICULTURE AND FISHERIES

TO INQUIRE INTO AND REPORT UPON THE SUBJECT OF

AGRICULTURAL EDUCATION

IN

ENGLAND AND WALES,

WITH

Copy of the Minutes Appointing the Committee

AND

APPENDICES.

Presented to both Houses of Parliament by Command of His Majesty.

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NOTE.—*The Minutes of Evidence taken before the Committee are printed in a separate volume* [*Cd* 4207, 1908.]

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COPY OF MINUTES APPOINTING THE COMMITTEE.

I.

I hereby appoint a Committee to inquire as to the provision which has now been made for affording scientific and technical instruction in agriculture in England and Wales, and to report whether, in view of the practical results which have already been obtained, the existing facilities for the purpose are satisfactory and sufficient, and, if not, in what manner they may with advantage be modified or extended.

The Committee will be constituted as follows :—

THE RIGHT HON. LORD REAY, G.C.S.I., G.C.I.E. (Chairman),
THE LORD BARNARD,
LORD MORETON,
MR. FRANCIS DYKE ACLAND, M.P.,
MR. DAVID DAVIES, M.P.,
MR. NORMAN LAMONT, M.P.,
MR. THOMAS LATHAM,
MR. JOHN CHARLES MEDD,
PROFESSOR THOMAS HUDSON MIDDLETON, M.A., M.Sc.
(One of the Assistant Secretaries of the Board of Agriculture and Fisheries),
PROFESSOR WILLIAM SOMERVILLE, D.Sc.,
MR. HENRY STAVELEY-HILL, M.P.

And I hereby appoint The Right Hon. Lord Reay, G.C.S.I., G.C.I.E., to be Chairman, Mr. Arthur Ernest Brooke-Hunt, of the Board of Agriculture and Fisheries, to be Secretary, and Mr. Henry Leon French, of the Board of Agriculture and Fisheries, to be Assistant Secretary.

(*Signed*) CARRINGTON,
President of the Board of Agriculture and Fisheries.

20th March, 1907.

II.

I hereby appoint THE LORD BELPER to be an additional Member of the Departmental Committee on Agricultural Education appointed by my Minute of the 20th March, 1907.

(*Signed*) CARRINGTON,
President of the Board of Agriculture and Fisheries.

22nd April, 1907.

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DEPARTMENTAL COMMITTEE ON AGRICULTURAL EDUCATION.

REPORT.

To the President of the Board of Agriculture and Fisheries.

My Lord,—

The Committee appointed by your Lordship to inquire as to the provision for affording scientific and technical instruction in agriculture and generally into the question of agricultural education, beg to report as follows:—

I.—INTRODUCTION.

Scope of the Enquiry.

1. No direct inquiry into Agricultural Education has taken place since 1887–1888, when a committee sat, under the presidency of the late Sir Richard Paget.

The present Committee realised the importance of the inquiry entrusted to them, and determined that it should be exhaustive. They, therefore, offered opportunity to all institutions in receipt of grants from the Board of Agriculture to send representatives to give evidence as to the character and extent of the provision made by such institutions in respect of agricultural education, and also to state their more pressing needs and requirements.

The institutions examined as to the character of their work, as to the success, or otherwise, of their efforts, and as to their needs, were as follows:—

Universities and University Colleges.

Cambridge.
Leeds.
Armstrong College (Durham University).
University College of North Wales, Bangor (University of Wales).
University College of Wales, Aberystwyth (University of Wales).
University College, Reading.

Agricultural Colleges.

South-Eastern Agricultural College, Wye.
Midland Agricultural and Dairy College, Kingston.
Harper-Adams Agricultural College, Newport, Salop.
College of Agriculture and Horticulture, Holmes Chapel.
Agricultural and Horticultural College, Uckfield.

Special Institutions.

British Dairy Institute, Reading.
Eastern Counties Dairy Institute, Ipswich.
National Fruit and Cider Institute, Long Ashton, near Bristol.
Royal Veterinary College, London.

Agricultural or Farm Institutes.

Essex County Technical Laboratories, Chelmsford.
Agricultural Institute, Ridgmont, Bedfordshire.
Cumberland and Westmorland Farm School, Penrith.
Hampshire Farm School, Basing.

2. Information was also sought from the council of every administrative county in England and Wales, as to the provision made by it for imparting technical and practical agricultural instruction, supplementary to the returns already made to the Board as to such work for the year 1905–1906. In addition to members of county councils connected with any of the above-mentioned institutions, witnesses representing the council of the following counties were examined :—

Berkshire.
Devonshire.
Dorset.
Gloucestershire.
Herefordshire.
Lancashire.
Monmouthshire.
Somerset.
West Sussex.
Wiltshire.
Worcestershire.

The witnesses from Lancashire gave evidence, amongst other matters, as to the work of the Harris Institute, the agricultural department of which is largely subsidised by the county council. This evidence was afterwards supplemented by a written statement furnished by the Council of the Harris Institute.

3. Evidence was also taken from the following institutions which are not at present in receipt of aid from the Board :—

University of Oxford.
University of Birmingham.
University of Manchester.
University College, Bristol.
Royal Agricultural College, Cirencester.
Agricultural College, Aspatria, Cumberland.
Dauntsey Agricultural School, West Lavington, Wiltshire.
Bigod's Agricultural School, Dunmow, Essex.
Worleston Dairy Institute, Cheshire.

Also from two institutions exclusively engaged in the teaching of women, viz. :—

Horticultural College, Swanley, Kent.
Horticultural College, Studley, Warwickshire.

4. In addition, various public bodies sent witnesses to appear before the Committee, including the Royal Agricultural Society of England, the Highland and Agricultural Society of Scotland, the Bath and West and Southern Counties Society, the Farmers' Club, the Lancashire Farmers' Association, the Royal Horticultural Society, the Horticultural Education Association, the County Councils Association, the Royal Meteorological Society, and the Worshipful Company of Farriers.

The Committee also obtained useful information from a number of persons who, although unconnected officially with any training institution or public body, had a special knowledge of agriculture or of some branch of it, or of some branch of science bearing upon it.

The Committee are indebted for written statements of their views to the Chairmen of the Dorset Education Committee, the North Riding of Yorkshire Agricultural Education Committee, and the Somerset Agricultural Instruction Committee, to the Agricultural Organisation Society and the Land Agents' Society, and to others unable to be present.

The Committee felt that it would assist them in their inquiry to receive evidence as regards agricultural education in the Colonies and India, and they found the evidence of the Hon. Sir John Cockburn, K.C.M.G. (late Minister of Agriculture, South Australia), Mr. G. Hogben (Inspector-General of Schools in New Zealand), Mr. W. H. Moreland, C.I.E. (Director of the Department of Land Records and Agriculture in the United Provinces of Agra and Oudh), and Mr. H. S. Lawrence (Director of Agriculture in Bombay), especially valuable and instructive.

With respect to the official evidence placed before them, the Committee derived much information from Major Craigie, C.B., whose wide knowledge and experience of the subject in its many bearings was of great value to them; and also from Professor Campbell, of the Department of Agriculture and Technical Instruction in Ireland, who described the well-organised system of agricultural education which is in force in that country, and, from his experience as a former professor of agriculture in England, contrasted it with the English system. Mr. F. Grant Ogilvie, C.B. (of the Board of Education), also attended before the Committee, and explained very fully what is now being done by that Board in respect of rural and agricultural education.

In all, 113 witnesses were examined, consisting of landowners, farmers, farm managers, estate agents, scientific experts and investigators, together with members of the teaching profession in its various branches associated with agriculture, or with general university education.

5. As regards the scope of the inquiry entrusted to them, the Committee considered that education of an elementary or secondary character did not come within their terms of reference, and as far as possible evidence directly bearing on these sections of education was excluded. At the same time it is clear that the question of early training has a very important bearing on subsequent technical instruction, a fact emphasised by many witnesses.

Historical Review.

6. Before dealing with the evidence brought before the Committee as to the provision made for agricultural education in this country to the present time, it may be desirable to trace the history of its progress.

As far back as 1790, a Chair of Agriculture and Rural Economy was, by a private benefaction, established in the University of Edinburgh. The stipend was only £50 a year, but this was increased in 1868, as shown below. 1790.

In 1796, the Sibthorpian Chair of Agriculture and Rural Economy was established in the University of Oxford. 1796.

The Royal Agricultural Society of England, founded in 1838 and incorporated by Royal Charter in 1840, had for one of its objects the taking of "measures for the improvement of the education of those who depend upon the cultivation of the soil for their support." The Society in 1863 formed a special education committee, and in 1868 they began to hold examinations in the science and practice of agriculture. 1838.

In 1845, the Royal Agricultural College at Cirencester was established and incorporated by Royal Charter. 1845.

The Highland and Agricultural Society of Scotland dates back to 1784, and was incorporated under Royal Charter in 1789. By a supplementary Charter, granted in 1856, the Society obtained special powers in connection with agricultural education, and in 1858 began to conduct an annual examination. In 1868, this Society succeeded in obtaining an increase of £300 to the stipend of the Chair of Agriculture in Edinburgh, one-half being contributed by Government and one-half by the Society. 1856

In the period between 1859 and 1873 several papers bearing on the education of the farmer's son were read before the Farmers' Club and the Central Chamber of Agriculture. 1859–1873.

7. In 1875, the Science and Art Department at South Kensington, in consequence of a memorial which, in the previous year, had been presented to them by the Highland and Agricultural Society of Scotland, added "Principles of Agriculture" to the list of subjects in which instruction could be given and grants earned under that Department. Subsequently, an effort to overcome the difficulty of obtaining teachers for such a subject, which was one of the greatest obstacles to its success, was made by instituting a Lectureship in Agriculture at South Kensington, and by the organisation of long and short courses for teachers. This Lectureship, however, was suspended in 1899. 1875.

8. The Royal Commission on Agriculture which sat from 1879 to 1881 stated in their Report that they had received a good deal of evidence upon the subject of agricultural education in Great Britain and foreign countries, and upon the desirability of encouraging scientific, together with practical instruction. The Commission concurred in this, and recommended the subject as well worthy of consideration. 1879–1881. C.—3309.

The Royal Commission on Technical Instruction of 1881 appointed a Sub-Commissioner—the late Mr. Jenkins, then Secretary to the Royal Agricultural Society of England—to inquire into the teaching of agriculture in foreign countries, and subsequently made recommendations which dealt, however, mainly with education in the upper standards of rural schools. 1881. C.—3981-i.

9. In 1886, the Farmers' Club again took up the question and, in 1887, the Departmental Committee, of which Sir R. H. Paget, Bart. was Chairman, was appointed by the Lord President of the Council "for the purpose of inquiring into and reporting on Agricultural and Dairy Schools in Great Britain which may properly receive Government Grants, and to advise as to the Department which should be charged with the administration of such Grants." 1886–1887.

Thus for a period of about a century there had been in the country indications of a desire on the part of leading agriculturists for increased facilities for agricultural instruction.

At the time when the Paget Committee sat and reported, the institutions in England and Wales affording facilities for scientific and technical instruction in agriculture were exceedingly few, and in no case assisted in any way by the State. They consisted of :—

The Royal Agricultural College, Cirencester,
The College of Agriculture, Downton,
The Agricultural College, Aspatria,
The Agricultural College, Hollesley Bay.

For dairy instruction, the only institution in existence was the recently-formed Worleston Dairy School in Cheshire.

The committee reported that very insufficient provision existed for agricultural teaching, and that in view of the fact that a new system had virtually to be created it would be inadvisable hastily to embark on any large or comprehensive scheme. Numerous recommendations were made as to how agricultural education should be promoted. The committee considered that their investigations clearly demonstrated two points, namely, that technical agricultural instruction, combining practice with science, was daily becoming more necessary, and that agriculture had a right to claim that in respect of education the interests of an industry so important to the country should be specially recognised.

C.—5285. C.—5313. They recommended, after hearing a considerable amount of evidence, that one central school should be established, principally as a training college for teachers of dairy work, and that this should be maintained at the cost of the State. They were of opinion that it would be far more satisfactory and complete if this one central normal school were established for the teaching of agriculture in all its branches, including forestry, gardening, fruit-growing, poultry and bee-keeping. They also recommended that there should be established five district dairy schools, one in each of the " agricultural produce districts " of England and Wales (together with two in Scotland), on which eventually, if the means were forthcoming, might be engrafted schools of general agriculture, so that they might become active centres of instruction and information in all branches of agriculture in their respective districts. It was also suggested that travelling lecturers should be attached to the district centres to give instruction within the district limits. In addition to the schools already suggested, the committee thought that pecuniary assistance might be given to other dairy or agricultural schools provided that they were established by local effort, were conveniently situated, and supplied a distinct agricultural want. The committee concurred in the opinion expressed by several witnesses that it would be beneficial if a school of general practical agriculture, suitable to the wants of the locality, and including an experimental farm station, were provided in the majority of counties, if not in each. As regards research, the committee recommended that an annual grant in aid, of £3,000, should be placed at the disposal of the Government Agricultural Department to be expended in investigation.

1894–1897. C.—8540. 10. The Royal Commission on Agriculture appointed in 1894 took some evidence on the subject of agricultural education, and in their Final Report, presented in 1897, contrasted the systems and methods employed in furthering agricultural education in Great Britain and foreign countries. They stated " Abroad, as might be expected, where the position and control of Agricultural Education is in the hands of the State, we find uniformity of system, a methodical distribution and graduation of the instruction given. . . . In this country there is no approach to any such system. The residue grant was unreservedly handed over by Parliament in 1891 to the various local authorities without an attempt to guide or harmonise its administration."

The Commission were of opinion " that to promote unity of aim and administration upon more clearly defined principles, the Board of Agriculture should be entrusted with more ample powers of control and inspection of the whole system of technical agricultural education than they now possess " ; and stated " we do not doubt that a good deal may be done by wise administration of the sums allotted by Parliament to supplement existing deficiencies. The attainment of this end might, in our opinion, be facilitated, and unity of aim promoted, by the extension to all parts of Great Britain of the inspection of the results of local educational administration by the Board of Agriculture, and by the collection

by the Board of full information with comments thereon by their skilled advisers, as to the nature, cost and results of the steps taken in the various districts to supply technical instruction in agriculture, which information should be embodied in a special annual report."

It is particularly worthy of note that the Commission considered that an adequate share of the residue grant under the Local Taxation (Customs and Excise) Act of 1890 should be devoted to agricultural education, and concluded their report on this point by saying that " if higher agricultural education is to become accessible to any but the comparatively well-to-do, it must be provided by collegiate centres such as those already in receipt of Government aid, whether of the type of the Newcastle and Bangor Colleges or of Wye College. If the experiment prove successful, and further aid is needed, we hope that the legislature will not consider themselves restricted to so small an annual grant as £8,000."

11. The Departmental Committee on the Fruit Industry in 1905 inquired into the question of education mainly from the horticultural standpoint. In their report they refer to the fact that in England two Government Departments—the Boards of Education and of Agriculture—are concerned in the work, with the result that there may be some overlapping. The committee go on to say that they " are most anxious not to disparage any of the good work which has been accomplished so far. But in view of the recent growth of the fruit industry, and its importance, and the ignorance which prevails with regard to many of its fundamental conditions, they cannot help feeling that it is inadequate." 1905. Cd. 2589.

12. The Departmental Committee on Small Holdings in 1906 also made some inquiry into the provision for agricultural instruction and, after referring in their Report to institutions such as the Basing Farm School, the Cumberland and Westmorland Farm School and the Ridgmont Agricultural Institute, summarised their recommendations with regard to technical agricultural education as follows :— 1906. Cd. 3227.

" That further facilities should be provided for agricultural instruction in rural districts, and that for this purpose an addition should be made to the present grant to the Board of Agriculture and Fisheries.

" That part of any such additional grant shall be applied to the systematic training of those who are intending to cultivate the land in a small way, and to the provision of simple demonstration plots—designed to meet the particular wants of small cultivators—under the supervision of the collegiate institutions already provided."

Privy Council and Board of Agriculture.

13. The result of the report of the Paget Committee was that a sum of £5,000 was placed by the Treasury at the disposal of the Agricultural Department of the Privy Council, the Government Department at that time entrusted with the control of agricultural matters, for the purpose of aiding agricultural and dairy schools. The Privy Council, and subsequently the Board of Agriculture, proceeded with caution to distribute such portion of this sum as they thought desirable. The first college to receive a grant was the University College of North Wales, at Bangor, which had recently added an agricultural department to its existing organisation. 1888.

The doubtful wisdom, considering the very varied conditions of farming which obtain throughout the country, of establishing a single agricultural institution, together with the fact that university colleges were willing to make provision for agricultural and dairy instruction in their particular localities, no doubt influenced the Board of Agriculture, and made them endeavour to develop teaching in local colleges. At the same time the training of dairy teachers was provided for at central institutions such as the British Dairy Institute and the Midland Dairy Institute.

14. The Committee understand that when the Board of Agriculture first made grants in respect of agricultural education, these were not only given to permanent institutions but were also awarded in respect of local classes and field experiments, which at that time were organised chiefly by agricultural and other similar societies.

Very shortly after the Board of Agriculture had begun to promote agricultural education in the way described, the aspect of affairs was materially changed by the provisions of the Local Taxation (Customs and Excise) Act of 1890. By this Act large sums were placed at the disposal of county councils for purposes of technical,

Report on the Distribution of Grants for Agricultural Education, 1891-2. [C. 6744.]

including agricultural, education. In view of this, and in order to limit, wherever practicable, the duplication of outlay from public funds, and also of machinery for agricultural instruction, the Board made it their aim in the distribution of the smaller funds entrusted to them to allot grants principally to institutions of a central character, leaving local authorities to assist the more local forms of instruction.

Appendix I. of the Report.

15. The Memorandum printed in the Appendix shows the gradual growth of institutions under the supervision of the Board of Agriculture, and it will be seen that new institutions were not allowed to spring up at random, but in accordance with local needs and opportunities. It will also be observed that, even with the limited means at their disposal, the Board have made an effort to carry out the recommendation of the Paget Committee as regards the provision of institutions of a general practical character, by subsidising places of the nature of the Cumberland and Westmorland Farm School, the Ridgmont Agricultural Institute and the Basing Farm School.

Work of the County Councils.

16. In the earlier stages county councils devoted, and still to a large extent devote, the funds allocated to agricultural education to work of a migratory character, a type of work which is bound to continue, if all classes of the agricultural community are to be reached. Some county councils, however, from an early date either devoted funds towards the promotion of technical agricultural education through permanent institutions or founded such institutions themselves. In addition to the previously mentioned institutions maintained or aided by county councils and assisted by the Board, the following permanent county council institutions exist in respect of which no grant is either directly or indirectly received from the Board of Agriculture.

The Lancashire County Council Dairy School and Farm.
The Worleston (Cheshire) Dairy Institute.
The County Dairy School at Gloucester.

17. The Board's Annual Report on Agricultural Education shows the main lines on which county work is now conducted. This, as already indicated, largely consists in the provision of lectures at local centres on agricultural subjects, including farm hygiene, poultry-keeping, bee-keeping, and horticulture; instruction in dairy work by means of classes in butter-making and in certain cases by provision for instruction in cheese-making; field trials and experiments; instruction in manual processes, and horse-shoeing; and in the provision of garden plots for instruction for youths and occasionally older men, which has been succeeded of late years by the provision of such plots for boys still at school. But while the above subjects are engaging the attention of certain counties it appears that in others little is being done. In no county can the provision for these subjects be considered to be fully satisfactory, and in some counties there is no provision of any kind. Certain counties carry out this work through permanent institutions, others through a staff specially appointed by the county.

Agricultural Education in Other Countries.

18. The Committee felt that it was important that they should have, in addition to oral evidence bearing upon the subject which might be given by witnesses, further information as to the provision of agricultural education in the colonies and in certain foreign countries. With this object in view they, at the outset of their inquiry, requested the Agent General for each of the self-governing colonies and the Foreign Office to furnish them with any laws, reports or other information which might be of value to the Committee. In response to this request the Committee received information from every colony and from many foreign countries, and they beg to tender their thanks for the assistance thus given. They desire especially to express their appreciation of the valuable report on Agricultural Education in the United States of America prepared, as a result of the letter from the Committee to the Foreign Office, by Mr. Esmé Howard, C.V.O., C.M.G., to whom and to the Rt. Hon. James Bryce, H.M. Ambassador at Washington, who gave directions for the preparation of the Report, the cordial thanks of the Committee are due. Mr. Howard's report was considered of such value that it was printed separately and published as a Supplement to the *Journal of the Board of Agriculture*.

Supplement, Vol. XIV., No. 10.

The information obtained from the Agents General and the Foreign Office was examined in the Intelligence Division of the Board, who prepared from it and from other information at their disposal statements of the condition of agricultural education in

some thirty countries. These statements included, in addition to general information, statistics as to the number and nature of institutions providing agricultural instruction, the numbers of students attending them, the fees paid, and the grants made to such institutions by local authorities and central governments. The Committee have, however, designedly refrained from printing these figures, as they are of opinion that, owing to the different circumstances of the countries in question, and particularly to the difficulty of ascertaining accurately the extent to which the aim of any of the institutions mentioned corresponds to that of institutions in England and Wales, such figures are not directly comparable. Rogers, 15429

In addition to the information above-mentioned the Committee have had brought specially before them the valuable reports published by the Foreign Office on Agricultural Education in Germany by Dr. James Rose, and on Agricultural Education in France by Mr. H. Austin Lee. Cd. 1387-7. C. 9045-35.

19. The Committee do not propose to refer at length to the general condition of agricultural education in foreign countries or the colonies, for it is obvious that the systems adopted abroad, however perfect in themselves, are not precisely applicable to the conditions existing in this country; and in any case no detailed examination of them would be possible within the limits of this Report. They propose, however, to allude here and also later (*see* paragraphs 47–50) to certain aspects of agricultural education abroad which appear to bear directly on questions of importance to this country.

The difficulty of influencing the actual cultivator of the soil is a problem common to agricultural education in all countries. While some countries feel this difficulty much more than Britain there is one especially in which it has been overcome, and in several others where this obstacle to progress was formerly a serious hindrance success may now be said to be in sight.

"However useful agriculture may be as a subject of instruction in schools and colleges, it is obvious that unless the farmer recognises the value of scientific knowledge to himself, as of assistance in the management of his land or of his live stock, the nation is not likely to derive much direct benefit from expenditure upon technical education in agriculture." As on this subject it appears to the Committee that this country may learn from the experience of others, a brief reference will be made to certain cases.

20. Denmark may be quoted as a State in which the problem of reaching the farmer no longer really exists. The Danish Government has liberally supported agricultural education, and has promoted, by a widespread but discriminating distribution of grants, the development of agriculture in all its branches. But this system cannot alone explain the remarkable progress of the last thirty years. Nor yet can it be entirely attributed to the teaching of the great leaders who appeared at a time when the nation, through economic and patriotic causes, felt the need of education. It is, above all, the desire for knowledge existing in Denmark—a desire shown by the people's high schools (*Folkehojskoler*), the village reading rooms, the itinerant teachers, and the widely circulated newspapers—which has made the task of the teacher an easy one.

This desire for knowledge, it must be admitted, is not a marked attribute of the agricultural classes in England, and in providing agricultural education for this country the greatest stress should be laid on all means calculated to arouse a demand for information.

21. The condition of affairs in Northern Germany 30 years ago, and in the Eastern States of America 20 years ago was almost precisely the same as in England at the present time. In both countries considerable progress had been made in providing teaching institutions well equipped for giving instruction in agriculture, but in neither country did the practical farmer show much personal interest in the instruction provided for himself and his son. A great change has recently taken place. Prussia, for example, is so convinced of the value of agricultural instruction that it gives in State grants a sum equivalent to about £50,000 to agricultural institutions of university rank and a similar sum to agricultural schools. So highly do agriculturists appreciate the assistance of men trained in these universities that they combine (in their chambers of agriculture and farmers' societies) to employ agricultural experts as lecturers, or as teachers in the local agricultural schools. Not only do agriculturists combine to provide instruction in agriculture, but, notwithstanding the large subventions given by the public authorities to experimental stations, some of the most important stations owe their existence to voluntary associations of farmers. This change in attitude of the German farmer is undoubtedly due to his realisation of the usefulness of technical instruction. While in Denmark the demand T. H. Middleton, 15442c-8.

of agriculturists has been for education of all kinds, in Germany it has been more especially for technical education, and, as has already been stated, no particular desire for education was manifested by German farmers until they were taught its value.

To the State in this case belongs the credit of having, by its policy, created a desire for knowledge. By a liberal support of higher education competent teachers were provided; by taking advantage of the genius of its scholars for working out details the State provided a supply of scientific facts and a system of knowledge precisely adapted to the special needs of the German agriculturist. The agriculturist, finding teachers he could trust and information that interested him, has abandoned his former attitude of indifference.

22. The course of development of agricultural education in the United States of America in some respects resembles the development in Germany. In general terms it may be said that the same policy has been pursued, for America has been the pupil of Germany. One feature of the history of American agricultural education is of special significance for this country. Long before there was any widespread system of agricultural education in Germany students in that country had been engaged in agricultural research. The results of this research formed the material which filled the agricultural text-books of the latter part of last century. When, after the passing of the Morrill Act in 1862, the Land Grant Colleges were established in America, teachers and students depended chiefly on German research for the subject matter of courses in agricultural science. The result of this use of applied science as it were at "second hand" was that it did not apply to the agricultural conditions of America, and much dissatisfaction was expressed with the results obtained from agricultural education. The reason for the dissatisfaction was, however, perceived and, by the passing of the Hatch Act in 1887 for the endowment of experiment stations, provision was made for the study of American agricultural problems under American conditions.

Because of the wide extent of the country and the very varying conditions of the different States, the cost of obtaining the required knowledge was necessarily great. At first, too, the novelty of the work and the inexperience of the workers proved a severe handicap; but, these preliminary difficulties having been surmounted, a striking change in the attitude of agriculturists to education took place. For particulars of this change, and of the very large sums which the United States of America now finds it desirable to expend in agricultural education and research, reference must be made to Mr. Howard's Report.

Acland, 2828-9; Drewitt, 12031; Hobhouse, 14849-50; Inskip, 3420*a*; Kidner, 6014*a*.

23. The case of the United States has been specially mentioned because the Committee believe that the attitude of the English farmer to agricultural education, referred to by several witnesses, is partly due to the same cause that hindered agricultural development in America.

Teachers in England and Wales are not sufficiently provided with material based on the close study of local conditions; there has been too free a use of information borrowed from other countries, and, while acquaintance with the results of contemporary foreign research is extremely desirable, an undue dependence upon them is apt to preclude that practical application to local conditions which the farmer rightly demands in the information he receives from his scientific adviser.

With regard to the general position of agricultural education in foreign countries the opinion may be expressed that although Britain was late in organising a system of agricultural education, the present condition of the subject and the prospects of further development are as hopeful as in the majority of the countries whose systems have been examined.

24. It may be desirable at this stage to refer to the provision made for agricultural education in those parts of the United Kingdom which do not come within the scope of this inquiry. In Scotland the system of higher agricultural education has not differed materially from that in England and Wales. In Ireland, however, the circumstances are different and the Committee desire to draw special attention to the provision for agricultural instruction in that country.

From Professor Campbell's evidence it would appear that the whole of the agricultural education in Ireland is under the direct control and supervision of the Department of Agriculture and Technical Instruction in Dublin and that no county participates in the schemes devised by that Department unless it raises a rate for the purpose.

Campbell, 11143*a*.

The Central Department directly control and finance the following institutions :— Campbell. 11148*a*–81*b*.

INSTITUTIONS FOR MEN.

The Royal College of Science.

The Albert Agricultural College, Glasnevin.

Three Provincial Institutions or Agricultural Stations (at Athenry, Ballyhaise and Clonakilty).

Avondale Forestry Station.

INSTITUTIONS FOR WOMEN.

Munster Institute, Cork.

Residential and Day Schools (the number at present is about 8 or 10, and is rapidly increasing).

The Central Department have also under their entire control several other schemes of an educational or quasi-educational character of which the following may be mentioned :— Campbell. 11143–6.

Special Investigations (including the production of early potatoes, tobacco, etc., investigation of diseases affecting farm stock, and seed testing and analyses, etc.),

Creamery Management, and

Pioneer Lectures.

In addition to the above, the Department of Agriculture and Technical Instruction in co-operation with the local authorities control and finance various other schemes of instruction of which the following may be noticed :—

Local Winter Schools of Agriculture (about 25 to 30 are held annually, the duration of the course being about 20 weeks).

Itinerant Instructors in Agriculture.

Field Experiments.

Instruction in Buttermaking, Poultry-keeping, Horticulture, Bee-keeping, Flax-growing, etc.

It is worthy of note that each year the County Committees are asked for their views as to the working of these schemes for the previous year, and with these opinions before them the Department draw up the new schemes. Campbell, 11352–3.

25. From Professor Campbell's evidence and from information which he subsequently forwarded to the Committee it would appear that the total annual cost of these various forms of instruction is approximately £83,000 ; of which £1,600 is from the Parliamentary Vote to the Royal College of Science, Dublin, £16,000 from local rates and the remaining £65,000 from the Department's Endowment Fund. Of this £65,000 from the Department's endowment, £27,000 is expended on those schemes in which the department and the local authorities are jointly interested, and £23,000 on agricultural colleges and schools for men and institutions of rural domestic economy for women.

In addition to the above, a further sum of £57,000 is annually spent on other schemes for the improvement of Irish agriculture (*e.g.*, live stock improvement and special aid to congested districts) regarded by the Irish Department as mainly educational, but not included above. Of this £57,000, £15,000 comes from local rates and the remainder from the Department's endowment.

The total annual income, therefore, available for the purposes of agricultural education in Ireland is £140,000, which is made up as follows : £107,000 from the Department's Endowment Fund (of which £78,000 corresponds to the Residue Grant which in England and Wales is paid direct to the County Councils), £32,000 from local rates, and £1,600 the estimated proportion of the Parliamentary Vote to the Royal College of Science expended on agricultural instruction.

II.—THE PROVISION FOR AGRICULTURAL EDUCATION IN ENGLAND AND WALES.

Existing Facilities.

26. The institutions providing scientific and practical instruction in agriculture may be classified under the following heads :—

1. Universities or University Colleges.
2. Agricultural Colleges.
3. Agricultural or Farm Institutes.
4. Special Institutions.

27. The present provision for scientific or technical agricultural education in the country can, perhaps, best be shown by enumerating (i) institutions of a permanent character in receipt of aid from the Board of Agriculture, which act as district centres; (ii) the counties with which they act; and (iii) any other institutions in receipt of aid in these areas. The degree of connection between counties and a university, university college, or place of higher agricultural education varies widely. In some cases an institution places its services at the disposal of the county in return for a grant; or, as in the case of the three Ridings of Yorkshire, the institution is the agent through which the county does the whole of its work.

1. Armstrong College, Newcastle-on-Tyne.
   (Acting in connection with the counties of Cumberland, Durham, Northumberland, and Westmorland.)

   Other institutions in this area :—

   1A. Cumberland and Westmorland Farm School, near Penrith.

2. Leeds University.
   (Acting in connection with three Ridings of Yorkshire.)
3. Midland Agricultural and Dairy College.
   (Acting in connection with the counties of Derby, Leicester, Lincoln (Lindsey), and Notts.)
4. University of Cambridge.
   (Acting in connection with the counties of Bedford, Cambridge, Essex, Hertford, Isle of Ely, Norfolk, Northampton, and Suffolk (East and West).)

   Other institutions in this area :—

   4A. Technical Laboratories, Chelmsford, Essex.
   4B. Ridgmont Agricultural Institute, Bedfordshire.
   4C. Eastern Counties Dairy Institute, Ipswich.

5. South Eastern Agricultural College, Wye.
   (Acting in connection with the counties of Kent and Surrey.)
6. Agricultural and Horticultural College, Uckfield, Sussex.
   (Acting in connection with the county of East Sussex.)
7. University College, Reading.
   (Acting in connection with the counties of Berks, Bucks, Hants, and Oxon).

   Other institutions in this area :—

   7A. British Dairy Institute.
   7B. Farm School, Basing, Hants.

8. Harper-Adams Agricultural College, Salop.
   (Acting in connection with the counties of Salop and Stafford.)
9. College of Agriculture and Horticulture, Holmes Chapel.
   (Acting in connection with the county of Chester.)
10. Harris Institute, Preston.
    (Acting in connection with the county of Lancaster.)
11. University College of North Wales, Bangor.
    (Acting in connection with the counties of Anglesey, Carnarvon, Denbigh, and Flint.)

12. University College of Wales, Aberystwyth.
(Acting in connection with the counties of Brecon, Cardigan, Carmarthen, Merioneth, Montgomery, Pembroke, and Radnor.)

To the above must be added the National Fruit and Cider Institute situated near Bristol, which, for purposes of research into cider making and for experimental work with regard to general fruit culture, acts in connection with the counties of Devon, Gloucester, Hereford, Monmouth, Somerset, and Worcester.

28. The Committee have had evidence from the Universities of Manchester and Birmingham and the University College of Bristol with regard to work in applied science, conducted at those institutions, and as regards possible developments in the direction of agriculture.

Evidence has also been laid before them that the University of Oxford is now engaged in the formation of a fully-equipped Department of Agriculture, the educational work of which will be confined to the University, though it will be prepared to deal with the elucidation of practical problems throughout the country generally.

Two of the institutions referred to by the Paget Committee, viz: the Royal Agricultural College, Cirencester, and the Aspatria Agricultural College, are still being carried on.

There are, as already mentioned, dairy schools of a permanent character maintained by the counties of Lancaster (at Hutton, near Preston), Chester (Worleston), and Gloucester.

There are also two horticultural colleges for women, at Swanley in Kent, and Studley Castle, Warwickshire.

In addition to the above-named institutions all the migratory work conducted directly under the auspices of county councils must be taken into account in estimating the extent of the present provision for agricultural education.

29. The Committee record with pleasure the progress of practical and scientific instruction in agriculture in this country during the past twenty years. Many witnesses testified to this progress and the Secretary of the Farmers' Club characterised it as "remarkable." Eve. 13042.
Whereas in 1887 there were only some four or five institutions engaged in providing courses of instruction in agriculture, or any branch of it, the Committee have, in the course of their inquiry, heard evidence from at least 24 institutions actively engaged at the present time in providing higher agricultural instruction.

During the twenty years, therefore, which have elapsed since the Paget Committee made its Report, the whole aspect of affairs in the country has changed and the foundations of a national system of agricultural education have been laid.

30. The Committee are of opinion that much remains to be accomplished before the subject can be said to have been placed in the condition which its importance demands. It is now recognised by all who have given any serious thought to the subject, whether in this country or in other countries, that, under the changed and keenly competitive conditions of the present day, education, scientific and technical, is essential to the success of any movement having for its object the improvement of the agricultural industry. However valuable the knowledge gained by practice may be, that knowledge must now be supplemented by scientific study.

Practical Results.

31. While as yet it is too soon to expect any marked general advance in the practice of farming as the result of agricultural education, the Committee have had evidence that changes are taking place. It is a matter of common knowledge that in times past large sums of money have been wasted in the purchase of unsuitable artificial manures and feeding stuffs. Great improvements in the use of these commodities, and local improvements in the practice of dairy farming, in the management of grass land, and in the care bestowed on the selection of the best varieties of field crops may be directly traced to the influence exerted by the work of agricultural institutions.

Refer to Effect and Value of Agricultural Education *in the General Index.*

There can be no doubt that in earlier days the practical farmer had by no means grasped the possibilities which science, properly applied, placed within his reach. Farmers doubted whether scientific men, or, as a witness put it, "a man of books," could teach Pennant, 6506.
them anything of value. On the other hand, the scientific man had not fully realised the limitations under which he himself laboured, nor that he had much to learn from a practical farmer.

The evidence taken before the Committee shows in an unmistakable manner that the attitude of farmers on the subject has undergone, or is undergoing, a change.

Hale, 13299-302, 13311; T. H. Middleton, 15459 *b*; Sutton, 4066-75, 4071-5; Turner, 14298-9.

Foulkes, 5750-1, 5800-2. Gilchrist, 530; Lawrence, 7275, 7403; Woodhead. 2181; Young, 1276-7.

It has been pointed out, too, that farmers require clear and accurate information upon subjects in which they are interested, and that any change in their attitude towards agricultural education of late years has been due to the fact that the advice they now receive is of greater practical utility than it formerly was. This is borne out by the fact that evidence has been given by the scientific staff of several institutions to the effect that they are regularly consulted by the farmers in their district when difficulties occur, and that the correspondence consequent thereon now forms part of the daily routine, and is often of considerable magnitude.

32. There appears to be a general concensus of opinion on the part of witnesses that each of the institutions now existing in the country, has, in its way, done useful and important work, but that the efficiency and utility of all of them would have been materially increased had they been better equipped with funds; evidence from all tends to show that their funds are quite inadequate for the work which lies ready at hand. The consequence has been that notwithstanding the progress made in agricultural education, and the interest aroused amongst more advanced farmers, at present the majority have not been reached.

Eve, 12975-83, 13101-10.

The Secretary of the Farmers' Club considers that there is still a feeling of dissatisfaction among agriculturists, and that the colleges, however well conducted, do not at present directly affect more than 5 per cent. of the farmers of England. Other witnesses also have agreed substantially with this, and have stated that at present the rank and file of farmers are not reached as they should be.

33. The Committee now propose to indicate where the existing facilities are sufficient and where improvements are required. For this purpose it will be convenient to deal separately with each type of institution or class of instruction. When consideration is paid to the different classes of persons for whom it is desirable to make provision, it is clear that different types of institutions are a necessity and must be included in, and form an essential part of, any complete and national scheme of agricultural education. Furthermore, although the different types of institutions required are fairly distinct, there must remain considerable diversity between institutions of the same type: each has its own individuality which it is desirable to maintain: within reasonable limits each should be allowed to develop according to the ideas and needs of the locality: rigid uniformity should be avoided.

Universities and University Colleges.

34. Universities and university colleges with agricultural departments provide, first of all, courses of instruction in agriculture and cognate sciences leading up to either a degree or a diploma, and secondly, conduct research into scientific matters relating to agriculture.

The Committee would like to emphasise the value and importance to agriculture of this class of institution, and note with satisfaction that agriculture has now received recognition in all the leading universities in this country.

T. H. Middleton, 15459*f*.

The existence of agricultural departments in universities, and university colleges gives to scientific specialists an opportunity of considering the relation to agriculture of their own subjects. Further, agricultural teachers have the advantage of being in close touch with science teachers generally. This association of teacher and investigator is especially valuable at those universities where a number of specialists are engaged in carrying on research in each of the natural sciences, for among the branches of knowledge studied there are always some which bear directly on agriculture. It was pointed out that the success attending the agricultural work at one university was largely due to the assistance given to the agricultural staff by other scientific workers who had made a special study of closely allied problems. The advantages of institutions of this class are not confined to those occupied in teaching, for agricultural students are brought into touch with those likely to be engaged in other callings, and this contact must lead to a general enlargement of the mind.

H. S. Lawrence, 16200, 16225-6.

Seton 30536.

35. For those who may ultimately become agricultural teachers or agricultural experts, a career is opening in this country and abroad, especially in our colonies and dependencies, and the Committee are of opinion that the universities, in making provision for the training of experts, are doing not only a National but an Imperial work. It was stated by one witness that but for the existence of agricultural departments at the Universities of Cambridge and Edinburgh an Indian agricultural department as now constituted would have been impossible, and another witness remarked that several of his

old students, holding responsible positions in different parts of the world, maintain close business associations with this country, and that "such persons are a distinct national asset."

Mr. H. S. Lawrence suggested to the Committee the establishment of a Readership in Tropical Agriculture at these universities. The Committee heartily endorse this proposal. They believe that if such a readership were established at one or more of the British universities it would be of considerable advantage to India, the West Indies, and other tropical and sub-tropical colonies. H. S. Lawrence, 16187-9, 16215-8, 16227-9.

The Committee consider that co-operation between agricultural institutions in this country and those in India and the Colonies would be of special value as regards post-graduate courses and the granting of degrees.

36. The Committee note with satisfaction that the University of Oxford is now engaged in developing a fully-equipped Agricultural Department on the old Sibthorpian foundation, which, though it dates from 1796, has so far contributed but little to agricultural progress. Recently the University have recognised Rural Economy as a subject for a degree and have instituted a diploma, while St. John's College are generously providing the buildings necessary for the use of the department. Somerville, 15042–115; Warren, 5411–71.

37. In addition to courses embracing the usual preliminary scientific training taken by university students, and lasting over three or four years, institutions of this type, as a rule, provide courses of a less advanced character, extending over two years and culminating in the granting of a diploma or certificate. These courses are arranged for farmers' sons and others having the prospect of the practical management of land, who do not take the more advanced courses. These institutions, further, act as the centres of instruction for surrounding counties and, according to circumstances, send out lecturers on scientific or on practical subjects, organise field experiments, and generally enable farmers to obtain the best and latest information on scientific points relating to their business.

38. The number of universities and university colleges, whether with complete agricultural departments, or with departments where only one or more branches of the subject are organised, must always be limited. The present requirements of the North, East and South of England, together with Wales, are sufficiently well provided for, but there are other parts of the country where the co-operation and influence of university teaching appear to be desirable. The Committee are glad to learn from evidence placed before them that the Universities of Manchester and Birmingham and the University College of Bristol are likely to exert a similar influence in the North-West, West-Midland and South-West districts of England.

Agricultural Colleges.

39. Agricultural colleges differ considerably in the scope of the education they offer, and also in their equipment and status. The College at Wye is one of the constituent schools of the University of London, and facilities are offered to students to pursue a course of study which will enable them to sit for examination for a degree in that university. Generally speaking, however, the usual courses at this and other agricultural colleges are similar to those less advanced courses conducted by university colleges, and terminate in the obtaining of a diploma or certificate. Such of these colleges as are in receipt of Government aid carry on external work for county councils in the way of lectures, and in the conduct of field experiments; they also act in an advisory capacity for farmers, but are less well equipped than universities, or university colleges, for conducting research.

Agricultural colleges are situated in the country, and a farm is attached to each. They appear to the Committee to be of great value as specially suitable for those without much previous knowledge of farming. At the same time experience has shown that they can be of great benefit to the sons of farmers.

40. The existing agricultural colleges are situated in districts where there are no university colleges with full agricultural departments. This observation will be equally true when the Royal Agricultural College, Cirencester, becomes a public institution, as the Committee understand is contemplated, and if an agricultural college were established in Devonshire under the Seale Hayne bequest. The institution at Aspatria has for many years been doing useful work. The Committee had evidence to the effect that it may no longer, in the event of the lease being discontinued by the present principal, be conducted as an agricultural college. It would be desirable in the interests of agricultural education that steps should be taken to place this institution on a permanent footing. M'Clellan, 10084. Smith-Hill, 7528–34.

As already stated, it is possible that universities or university colleges in the neighbourhood of the existing and projected agricultural colleges may in the future found departments

of agricultural science. If this were done and a connection were established between the university and agricultural colleges the district so supplied would be as fully equipped with facilities for higher agricultural education as the rest of England and Wales.

Brooke-Hunt, 15586*b*, 15587*a*.

Short Winter Courses at University and Agricultural Colleges.

41. In addition to the ordinary courses of instruction offered by university and agricultural colleges, some of these institutions make a feature of short courses for young farmers.

These courses are held in the late autumn or winter and last from six to nine weeks. In so short a time it is not possible to convey much information, but it is possible to teach an intelligent young farmer how he may set about gaining information for himself, and the Committee have had evidence that in some districts much good has resulted from these short courses. In South Wales for example, it would appear from a statement handed in by Principal Roberts of the University College of Wales, Aberystwyth, that 370 young farmers have attended the winter course. Nearly all these young men are now farming in South Wales, and a witness from one of the Welsh counties testified that every part of the county from which he came had been reached and influenced by the college through its short courses.

Jones-Davies, 8337–9.

42. In some instances the usefulness of a short course has been extended by the formation of an association of old students, to keep them in touch with their college. Very successful societies have been formed in connection with the University College of Wales, Aberystwyth, and Armstrong College, Newcastle-upon-Tyne. The former has a membership of 362, and the latter of 138.

These societies have an annual re-union at which papers on agricultural subjects are read, and arrangements made for carrying out field experiments on the farms of members. Competitions are also conducted and prizes given for the best essay on an approved theme, for the most interesting exhibit at the annual meeting, the best crop of roots, the greatest yield of milk from any one cow in a specified period, and other matters of practical interest.

Special Courses for Rural Teachers.

Refer to Elementary School Teachers *in the General Index.*

43. Several witnesses have drawn attention to the fact that some of the institutions subsidised by the Board of Agriculture provide scientific and practical instruction in those sections of "agricultural science" which are of use to school teachers in connection with "nature" courses. Instruction of this kind is valuable in two ways: it not only benefits the teachers attending the courses, but it benefits the institutions themselves. Many of the teachers who have attended these courses continue to take an interest in agricultural subjects, and are the means of drawing attention in their districts to the advantage offered by increased technical knowledge in agriculture.

Courses during the Long Vacation have been held at Cambridge in each year (with one exception) since 1893, and the attendance has varied from 40 to 120. At Leeds a course has been held at the Garforth Farm since 1901 on every Saturday from September to May, and the annual attendance has varied from 9 to 36. At Chelmsford (County Laboratories) a similar course has been held for a great number of years. Among institutions not aided by the Board of Agriculture it has been ascertained that the Swanley Horticultural College provides summer courses of instruction for teachers. The courses attract an average attendance of about 50.

The Committee recognise the value of the opportunities now offered to certificated teachers to obtain a third years' course of instruction at some agricultural or horticultural institution.

Special Agricultural Schools.

44. The Committee have received evidence from the Dauntsey Agricultural School at West Lavington, Wiltshire. This school, established in 1895, on an ancient foundation, under the Endowed Schools Acts, was, by its scheme, placed under the inspection and examination of the Board of Agriculture. It now earns grants from the Board of Education, and is under their inspection. The school has secured a considerable measure of success, and is particularly suitable for farmers who do not wish their sons to attend an ordinary secondary school, but prefer to send them to an institution giving a sound general school education coupled with as much instruction in the science and practice of agriculture as is possible between the ages of 14 and 17. Although some pupils on leaving continue their education by going to an agricultural college, the great majority finish their education at the school. Evidence was also received from a similar school at Bigods, Essex, but this institution has since ceased to exist.

While recognising the value of these schools, and the possible foundation of others of a similar nature in suitable circumstances, the Committee consider that such schools, being held by the Board of Education to be of a secondary character, do not come within their terms of reference. They refrain, therefore, from making suggestions or recommendations.

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45. Universities and university and agricultural colleges are primarily intended for those who have continued their general education until 16 to 18 years of age. Not infrequently, in the case of short-course students, the only previous education has been that of the elementary school, but short courses, however useful, would not in themselves justify the existence of agricultural departments in university colleges, or of agricultural colleges. An institution of this grade must have as its first object the provision of instruction for those who have had a good general education. The evidence taken by the Committee has satisfied them that the addition of a few institutions, so located as to supply the needs of one or two districts which at the present time have no agricultural college, would furnish the country with a sufficient number of collegiate centres.

Winter Agricultural Schools.

46. On the other hand, there is in this country a marked need for some form of institution providing agricultural instruction of a suitable kind for those who have had little or no secondary education. The majority of those who become farmers in England and Wales leave school to begin practical work between the ages of 13 and 15, and until this large class has some suitable form of technical instruction within reach, it is clear that the system of agricultural education in this country cannot be regarded as satisfactory.

The Committee have heard of only four institutions providing instruction exclusively of the nature described, viz., the Cumberland and Westmorland Farm School at Newton Rigg, near Penrith, the Bedfordshire Agricultural Institute at Ridgmont, the Winter School held at the Essex County Technical Laboratories, Chelmsford, and the Hampshire Farm School at Basing.

Technical education suitable for lads whose general education ends between the ages of 13 and 15 might be provided on one of two plans, both of which have met with much success on the Continent. The pupil on leaving the primary school might go, as in France, to a Practical Farm School, or he might go home to farm, returning after gaining some practical experience to a Winter Agricultural School as in Holland, Denmark and Germany.

Before the Committee state the conclusion to which they have come, the nature of some of these Continental schools may be briefly described, of which further particulars will be found in Appendix III.

47. The practical agricultural schools of France (*écoles pratiques d'agriculture*) were established by a law passed in 1875, and have largely taken the place of the older Farm (apprentice) Schools (*fermes écoles*) which were commended by Mr. Jenkins in his report to the Royal Commission on Technical Instruction. The modern agricultural schools, 38 in number, are usually located on farms varying in size from 100 to 350 acres. The land is farmed for profit by the director of the school. In addition to the director the staff of the school includes, as a rule, three superior and three or four subordinate teachers. The pupils, who generally number about fifty, enter at from 13 to 18 years of age and remain for from one to three years; the usual age of entry is 14 to 15 and the usual time spent at school is two years. Most pupils are boarders. The instruction is partly general and partly technical, the latter, including all the ordinary subjects of an agricultural education, is both theoretical and practical. Half the day is spent in manual labour on the farm; object lessons are much used in giving instruction, and the whole course is adapted for lads who have not had a secondary education.

C. 3981–I, *refer also to* a Paper by M. Henry Grosjean, Conference on Agricultural Education, Gloucester, 1904.

While the French schools, by bringing lads to live upon well-managed farms for the whole year, aim at teaching the practice as well as the elementary principles of agriculture, the winter schools of other countries necessarily confine their teaching chiefly to principles, and the lad is supposed to gain a knowledge of agricultural practice on his father's land. After he has been at home for a period which varies in different countries from one or two to eight or ten years he returns to school for the purpose of gaining information bearing on subjects of which he already has a practical acquaintance.

48. For many years winter schools have formed an essential part of the educational system of Holland. There are now six State winter schools in the Netherlands in addition to 231 local winter courses for young farmers. The winter schools are held in

buildings provided by the Communes, but all expenses, other than on buildings, are borne by the State. The schools are open from October to March, and the full course lasts for two winters. Pupils are not usually admitted until over 16 years of age, they must possess some practical knowledge of farming or gardening, and must also pass an examination in elementary school subjects. At the end of the first winter session there is an examination and only those likely to profit by a second course of study are allowed to return. A diploma is granted at the end of the course. The schools meet five days a week, from two to six in the afternoon. The staff includes teachers of agriculture, horticulture, natural science, and veterinary science.

49. Denmark possesses forty-three agricultural schools, all of which provide winter courses, the session lasting from November till April. In some cases the full course extends over two winters. After leaving the primary school at 14, lads return to their homes for a few years, next commonly go for a winter or two to one of the people's high schools for the purpose of continuing their general education, then return to farming, and, after gaining some further experience, take a course at an agricultural school. The age of pupils at the agricultural schools may vary from 18 to 35, the average age being about 23. When the high schools were started they had agricultural "sides," but these were not satisfactory. Agricultural schools were then founded generally in proximity to the high schools so that the services of certain teachers might be available for both institutions. The success and popularity of these schools may be judged from the fact that each winter they are attended by some 3,000 pupils. The schools are private ventures subsidised by the State and the local authorities, whose combined subvention averages £210 per annum for each school. The State also makes grants to the county school boards for the purpose of providing scholarships for poor pupils. The pupils are all boarders, are subjected to no examination, and get no certificates. The school day lasts seven hours, and the subjects studied are those usual in an agricultural curriculum.

See Appendix III. of the Report.

50. In the German Empire provision for the lower grades of agricultural education is made by two types of institution. The less common—the farm school—is similar in character to the farm schools of France (*fermes écoles*). The school is situated on a well-equipped farm, the farmer is school director, and is assisted by one or two instructors, including a veterinary surgeon. The pupils must be strong and healthy, and have attained the age of 17; they work regularly upon the farm and receive a limited amount of theoretical instruction. The second type—the winter agricultural school—is very popular in some parts of Germany, and Prussia alone has 148 of these institutions. While the courses of study are similar to those pursued in Holland and Denmark, the pupils are allowed to enter at an earlier age. Fifteen is a common age, and pupils of 14 are often admitted. Children may pass direct from the primary schools to the winter school without engaging in practical agriculture, but as pupils return to their homes in summer they will always have an opportunity of gaining a slight acquaintance with practical farming before completing the two-year course at the winter school.

51. There is no school in England and Wales precisely resembling the French *école pratique d'agriculture*, and although there may be districts in which schools of this type would be appreciated, the Committee do not consider it desirable that they should be established throughout the country. As a rule in this country the practical knowledge which a young farmer is able to get at home is of a satisfactory kind, and though it is admitted that he might be more systematically instructed in the manual processes of agriculture on the farm attached to a well-equipped school, it is doubtful if the pupil would thereby learn to be a better farmer. Many witnesses pointed out that a lad who has had some practical experience at home makes a much better pupil than the boy fresh from school.

Refer to Farming, Knowledge of Practical, *in the General Index.*

It has been represented to the Committee that if a lad once leaves school and begins farming it is difficult to get him to return. This is an undoubted difficulty, but on the other hand it must be pointed out that the longer a boy's entrance on agricultural life is delayed, the greater is the risk that he may forsake agriculture for some other occupation. Attention must also be directed to the great advantage which the agriculturist derives from beginning to learn his business at an early age.

There is a further point of some importance in comparing practical schools with winter schools. At the former the pupils, in order to gain experience, must spend half their time in manual work. To this, British parents might object on the grounds that if their children were engaged in unskilled manual labour, they would be better employed assisting in farm work at home.

Apart from these theoretical considerations the Committee find evidence which points to the winter school rather than the *école pratique* being the more suitable for this country. Where lower grade agricultural education has been attempted in England, the form adopted has usually been that of the winter school. Four local authorities have established the institutions previously mentioned where winter courses in agriculture are provided, and the successful short courses, held at university and agricultural colleges, have all been winter classes.

52. In introducing a system of winter schools into England it would not be desirable to lay down a code of hard and fast regulations, as it is likely that schemes of different character would suit different parts of the country. But the Committee regard it as important that the following provisions should enter into schemes formed for winter schools. The age of admission should, as a rule, be not less than 16, and the school ought to aim at training lads of from 17 to 20 years of age. Only pupils possessing some practical knowledge of agriculture or horticulture should be admitted, or at any rate, they should be preferred. As soon as possible a simple entrance examination should be instituted. The chief object of this examination should be to give to a lad who has left the ordinary school, and is working on a farm, some incentive to keep up his general education. The full course of study should extend over two winter sessions of from 16 to 20 weeks each. At the end of the first session an examination should be held and only those who showed progress should be allowed to come up for the second year's classes. In order to emphasise the importance of the second year's study the value of any scholarships awarded in connection with the course should always be higher in the second session than in the first.

While a system of winter schools covering all parts of the country is desirable, the Committee realise that, at the present time, the lack of suitable teachers precludes any large addition to the number of winter schools; they believe if the policy of establishing these schools were approved by Government, and if a beginning were made on a small scale, that a supply of teachers would be forthcoming, and that within a period of ten years from fifty to sixty winter schools should be provided in England and Wales.

Local Winter Classes.

53. The attention of the Committee has been called to another type of winter course which has met with very considerable success in the small number of instances in which it has been tried in England; this is the local winter class for young men, so popular in Holland. No special buildings are required for these classes, one or two rooms are taken in a market town or other convenient centre, and classes are held either daily for a few weeks, or on one or two nights each week throughout the winter. The instruction has special reference to local agricultural conditions and is of a simple and practical character, embracing, for example, farm hygiene, book-keeping, and mensuration. A course of this description dealing with the results of crop experiments made in the district during the previous summer affords one of the best means of interesting farmers and of arousing in them a desire for further information. Until winter schools are available and are resorted to freely by young farmers it is specially important that these local classes should be encouraged. Even after the country has been provided with winter schools, the winter classes would prove useful as feeders for the fixed institution, and would also enable the county instructor to keep in touch with men who have passed through the winter schools.

Druce, 3568, 3694, *Refer also to* Gloucester—Classes for Farmers' Sons, *and to* Hereford—Short Agricultural Course, *in the General Index.*

Educational Work of Agricultural Societies and of Analogous Associations.

54. The Committee have received particulars of the educational work which, throughout a long series of years, has been carried out by the Royal Agricultural Society of England, the Highland and Agricultural Society of Scotland, and the Bath and West and Southern Counties Society. These societies, by their journals and other publications, exercise considerable influence, and are valuable auxiliaries in the cause of agricultural education.

The first-named society edited and published, in 1892, a text-book on Agriculture, prepared by the late Dr. Wm. Fream, which is recognised as a standard work for students. It has also published a number of pamphlets dealing with a variety of practical questions and a series of diagrams on various agricultural subjects, botanical and entomological, printed on large sheets suitable for hanging up in schools, together with sets of lantern slides for lecture work. The society has also organised, in connection with its annual country meeting, an agricultural education exhibition which has proved of very great

interest and value and has done much to stimulate and to popularise the cause of agricultural education.

The Royal Agricultural Society and the Highland and Agricultural Society co-operate with regard to a yearly practical examination in dairying. They also jointly conduct a yearly examination in agriculture, which is the successor of the Diploma Examinations previously held for a number of years by each society separately. A large and increasing number of candidates enter.

The Bath and West and Southern Counties Society has been largely instrumental in promoting the cause of dairy education in the West of England, and has assisted the counties with which it is connected in conducting butter and cheese schools, and in other ways, such as by field experiments, by the promotion of instruction in farriery and also in cider-making. This and other societies now hold an agricultural education exhibit in connection with their annual shows.

The Committee have also received evidence of the valuable educational work of the Royal Horticultural Society. Mention may be made here of the excellent publications of this Society and of the Farmers' Club, the British Dairy Farmers' Association, and the two Royal Arboricultural Societies.

55. It is not, of course, possible for the smaller agricultural societies to do as much as the societies above-mentioned, but the Committee feel that it would be a great incentive to those who are promoting agricultural education if Agricultural Societies, Chambers of Agriculture and Farmers' Clubs would endeavour to help forward the movement; for instance, first, by bringing the members of their association into close touch with agricultural colleges or other institutions in the counties, and secondly, by offering to suitable students scholarships tenable at agricultural colleges, or prizes at local exhibitions open to those who had undergone a course of instruction during the previous year, or by starting experimental plots.

Peter, 9755–9889. Turner, 7788 *et seq.*

As an example of the useful work that can be done by a local agricultural society, the Committee would instance that conducted in Gloucestershire by the Berkeley Hunt Agricultural Society by means of classes and competitions for the young farmers of the district.

Another way in which societies might help would be in co-operating with local authorities which provide instruction in manual processes.

56. In several foreign countries agricultural societies take an active part in the promotion of agricultural education. In Germany, for example, the agricultural societies not only subsidise experimental stations, but employ teachers, some of whom are engaged principally in visiting and giving advice to the members of the Society. In France, moreover, voluntary societies, such as the *Syndicats Agricoles* and similar associations, have rendered invaluable assistance to the Government in promoting agricultural education.

T. H. Middleton, 15442*d*.

See Memorandum by M. Tisserand (Report of Recess Committee, 1896, pp. 218, 219).

Instruction in Dairying.

Ashcroft, 2338–54, 2436–9, 2443.

57. Dairying is a most important subject and the Committee have noted with satisfaction the great increase in facilities for instruction in it since the Paget Committee reported. It was pointed out by one witness that up to twenty-five years ago there was no place where a person could learn dairying, or even obtain information on the subject.

At the present time, in England and Wales, there are two institutions where instruction of a high character can be obtained in all branches of the subject, and four other permanent institutions of a less advanced character devoted entirely to dairy teaching; while at nearly all the institutions enumerated in paragraph 27, dairying forms some part of the instruction obtainable. In addition to the work carried out at the above permanent institutions, migratory instruction, chiefly in butter-making but also in some cases in cheese-making, is provided in about half the counties in England and Wales, although the courses vary from a few classes in butter-making to instruction continued throughout the whole year.

58. The demand for instruction at the leading institutions has been steadily increasing; but though the provision made by these institutions is excellent, the Committee believe that if increased funds were available both for teaching and equipment, the work done would be of still higher value, and the level of dairy teaching in this country brought up to that in those foreign countries which compete in our markets.

The question of the provision of instruction in dairying was considered by the Second International Dairy Congress, held at Paris in October, 1905, and resolutions passed calling attention to the need for further scientific research and increase in the present provision of instruction in this subject. Cd. 3689.

59. The attention of the Committee has been drawn to the need for developing experiment and investigation in connection with dairy work, more particularly as regards micro-organisms and their influence on the manufacture of different varieties of cheese. Some research work in this direction has been carried on, but much more is required, which would be of immediate practical application and pecuniary benefit. At present this country, in the matter of dairy research, has largely to rely upon foreign sources. A case was mentioned by one witness of a research worker in Yorkshire for whom a sum of £30 was with difficulty obtained in order that he might go to Switzerland in search of information on a certain problem on which he was working. On arrival he found that the Swiss Government were spending no less than £4,000 upon the same problem. Bickersteth, 3092*a*.

60. At all institutions which make provision for dairy-teaching, the instruction given has reference to the handling of milk and its conversion into butter and cheese, but the Committee are of opinion that more attention should be paid to the production of milk as well as to its sanitary distribution. The study of micro-organisms in connection with milk contamination is one which requires special consideration from the agricultural expert as well as from the medical man. In the breeding and in the rearing of dairy cattle, with a view to increase the yield and quality of milk (assisted as this can be by the keeping of milk records) and in the possible improvement of methods of milking there is a wide field for investigation and instruction. Ashcroft, 2484; Percival, 4265–75; Turner, 7938–44.

61. The Committee learn that in the earlier days of technical agricultural education a large number of counties devoted funds to local classes in dairying. This was one of the first subjects to engage the attention and arouse the interest of farmers. This subject has not, as a rule, been systematically developed, and in many cases consists only of a few isolated lessons during the course of the year. The Committee would suggest to the Board of Agriculture that they should endeavour to stimulate local authorities to pay greater attention to dairy instruction. There is always likely to be a market in this country for the best class of produce and for milk produced under thoroughly hygienic conditions.

Instruction in Poultry-Keeping.

62. Instruction in poultry-keeping is given at some of the colleges, while migratory work is promoted by some county councils, but in view of the importance of the industry, especially to cottagers and small-holders, the Committee consider that the subject should be more generally and fully provided for. The keeping of poultry is making rapid advance and, although no actual statistics are at present available, common observation shows that the number kept has increased very largely of late years. Mr. Edward Brown, who has done much to promote the industry, stated that there was scope for a still greater increase. There seems to be a wide field for experimental work and research in connection with this subject, many problems awaiting investigation; and the Committee are of opinion that work of this nature should be undertaken. Brown, 6254–8.

Instruction in Bee-Keeping.

63. Attention may be particularly drawn to bee-keeping on account of its importance to all dwellers in rural districts, especially cottagers and small-holders.

The Committee received valuable and interesting evidence on the subject from two representatives of the British Bee-Keepers' Association, one of whom stated that bee-keeping is the most remunerative petty industry in connection with agriculture or horticulture. Indirectly it may be even more remunerative, in view of the useful function which bees perform in fertilising fruit blossoms. Reid, 14591.

The question of the importance to fruit growers of keeping bees engaged the attention of the Fruit Committee, and they recommended "that it would be an advantage to fruit growers if they kept bees in connection with their fruit plantations." The witnesses mentioned above gave, before this Committee, much evidence in support of that recommendation; definite cases were given showing the benefit that fruit growers had derived by the keeping of bees. In one case the yield was by this means increased "simply marvellously"; and in another an orchard, previously unproductive, began, as soon as bees were introduced, to yield an abundance of fruit. Cd. 2589, p. 39. Reid, 14629. Cowan, 14769.

The Committee, therefore, feel that provision for instruction in this subject, including the preparation of honey for market, should be made in many counties where it is at present unavailable, and the production of honey in this country thereby largely increased.

Instruction in Horticulture and Fruit-Growing.

Cd. 2589.

64. This Committee have not inquired specially into horticultural education, because it is covered by the report issued by the Departmental Committee on the Fruit Industry in 1905.

Owing to the increased demand on the part of the public for fresh fruit and vegetables, horticulture and fruit-growing are being rapidly developed in this country; and the question of the provision of horticultural instruction is undoubtedly one of importance.

65. Fruit farming and market gardening on a large scale is a business of a highly technical character, demanding no ordinary degree of skill, training and business capacity, while those embarking upon it must be possessed of ample capital. Large growers, therefore, require all the assistance which science can place within their reach.

Although on a large scale it is only suitable in certain localities, on a small scale it can with advantage be practised in almost any part of the country. It is also an industry specially adapted for small-holders, and the Fruit Committee "were greatly struck on the occasion of their visit to Evesham with the intelligence and business capacity displayed by the members of the local Market Gardeners' Association, most of them growers on quite a small scale, and many of them men who had raised themselves from the position of labourers."

Ibid, p. 2.

Horticulture is also of much importance as a subsidiary industry—being a pursuit of a profitable and specially attractive nature—to those engaged during a large portion of the day in other occupations.

66. As regards the higher forms of instruction in horticulture, the Committee are of opinion that departments such as that at the University College, Reading—where excellent work is being carried out with quite inadequate means, and without any direct aid from the Board of Agriculture—should be encouraged by means of grants.

67. Such departments would also be of considerable value to some of the Colonies. Dr. Keeble, the Director of the Horticultural Department at Reading, pointed out that if its work were made widely known throughout the Empire, not only could that Department receive for training holders of Colonial scholarships, but Englishmen would be encouraged to fit themselves for horticultural work in the Colonies. The needs of the West Indies were specially instanced.

Keeble, 4391.

68. The Committee have had evidence with respect to the useful theoretical and practical instruction for women provided at the horticultural colleges at Swanley, in Kent, and Studley, in Warwickshire. At the former, too, the short courses of instruction for mistresses in elementary and secondary schools have been of considerable value.

69. From the evidence received as to instruction in grading and packing fruit and vegetables for transport, the Committee are of opinion that the teaching of this subject has hitherto been somewhat neglected, and would urge upon the Board of Agriculture that in institutions in receipt of grants from them adequate instruction and practical training should be provided.

Refer to Subjects of Instruction—Horticulture, *in the General Index.*

70. In view of the importance of horticulture to small-holders and labourers, to women as well as to men, the Committee are of opinion that every county should employ an official responsible for the conduct and supervision of all forms of horticultural instruction in the county. Possibly in the case of some of the smaller counties this arrangement might be carried out in combination with one or more adjoining counties. The Committee indicate later that horticultural work in a county should be associated with a Farm Institute, and consider that in connection with such instruction plots should be arranged to demonstrate methods of fruit and vegetable culture.

The educational value of garden plots is becoming more widely recognised and they have proved effective in promoting interest in improved horticulture. The Committee would, therefore, welcome their general adoption in suitable localities.

71. The Committee have learnt with pleasure of the likelihood of an institution being established in the near future in the vicinity of London at which investigations and research in matters relating to horticulture will be promoted, and practical and scientific training provided.

See reference to the Innes Bequest, Brooke-Hunt, 15659*b*, 15660–2.

Investigation and Instruction in Cider-Making.

72. The Departmental Committee on the Fruit Industry referred to the fact that the public taste for cider, and its manufacture, had been falling off for many years, but stated that "in the last ten years renewed attention has been paid to the industry; a considerable amount of planting has taken place of cider varieties of apples, especially in Herefordshire, and organised efforts have been made with considerable success to revive the trade." For instance, a witness before that committee estimated that the value of the cider produced annually in Herefordshire alone was £600,000, and Mr. B. T. P. Barker, the Director of the National Fruit and Cider Institute, stated in his evidence before this Committee that "putting the estimate at a low figure, the cider produced in Somerset alone may be estimated at £250,000 worth annually," a figure which corresponds with one given by the county horticultural instructor for Somerset in his evidence before the Fruit Committee. The industry of cider-making is spread over several counties; and in the opinion of the Committee deserves increased attention.

Cd. 2589, p. 3.

Cd. 2719, Q. 2266.

Barker, 8452.

Cd. 2719, Q. 902.

73. The above-mentioned Institute was established on the initiative of the Board of Agriculture, with a view of carrying on investigations and research into all matters connected with cider-making and the growth of the best varieties of cider and perry fruit.

Refer to National Fruit and Cider Institute *in the General Index.*

It was stated by the chairman of the agricultural committee of one of the counties supporting it that, in his opinion, the Institute was splendidly conceived, and that its work must ultimately prove of the greatest benefit. The progress of investigation must always be slow, and it is in this case especially so, owing to the fact that the volume of research demanding immediate attention is greater than the staff at the Institute can possibly cope with. As a consequence of this, many important lines of research which might lead to results of much practical value have to be left untouched.

J. W. Smith, 12285–6.

The Committee regret, now that the Institute has been established and has gained the confidence of the leading cider-makers in the country, that its operations should be seriously hampered, and its power to undertake research limited, by want of funds.

Instruction in Manual Processes.

74. Under this heading are included hedging and ditching, draining, stacking, thatching, ploughing, and similar arts, some of which show a tendency to deteriorate, though a knowledge of them undoubtedly increases a man's wage-earning capacity.

From the evidence placed before the Committee there seems little doubt but that instruction in these various processes, where provided by county councils, agricultural associations and other bodies, has had an excellent effect. Unfortunately there are not many counties where systematic work in this direction has been undertaken. In some districts, however, instruction in these subjects of a systematic and practical character is provided for young farmers, as well as for labourers, and the Committee are satisfied of its importance and value.

Grant, 10356; Peter, 9757, 9759; Alltoft, 10599–10758.

Instruction in Farriery.

75. In few subjects, twenty years ago, was there greater need for instruction than in horse-shoeing. The old art of hammering iron seemed fast to be dying out; ready-fullered iron was in constant use, and in order to save trouble contracts were entered into for the supply of ready-made shoes. Horses' feet were made to fit the shoes, rather than the shoes made to fit the feet. The majority of smiths, too, were in complete ignorance of the structure of a horse's foot. Although at first many smiths would not admit that they had any need of instruction, yet in those counties where instruction has been systematically given they now see the great benefit of it, and will often go long distances at night-time to attend a class or confer with the instructor.

Sheather, 10827.

Instruction in this subject, while provided for a number of years by a few county councils, has never been general throughout the country, and has now been abandoned by more than one county where formerly it was provided. Considering that it is a subject affecting all who use horses, including the army, the Committee think that all counties should be urged to make provision for instruction in the subject, and that such instruction should be continuous—not, as is often the case at the present time, taken up for a period and then allowed to drop.

76. A change has undoubtedly taken place in those counties where instruction in horse-shoeing has been provided. Mr. Sheather, Master of the Worshipful Company of Farriers, stated that since 1889 horse-shoeing had improved very considerably and that the shape

Sheather, 10861.

Grant, 10363. of each foot is now studied by the smith. Mr. Grant, the director of agricultural education in Monmouthshire, where instruction and examination in shoeing have long been going on, as well as witnesses from other parts of England, testified to the value of this class of instruction in improving the quality of the work. The Committee are satisfied that instruction in farriery is greatly appreciated by all who keep horses.

Sheather, 10761–2, 10847–52. The work of the Farriers' Company in organising examinations for smiths has been particularly useful, and it would appear from Mr. Sheather's evidence that they are endeavouring gradually to improve their examinations and to raise the standard of the certificate they award. Various agricultural societies have also done useful work in this direction, especially in conducting competitions in the showyard.

Instruction in the principles of Animal Hygiene.

McFadyean, 9731. Cave, 9503. 77. Witnesses have impressed upon the Committee the great interest which farmers take in instruction in veterinary or farm hygiene. One witness, Mr. Cave, now Professor of Veterinary Science at the College at Wye, stated that during the last fifteen years he has, in the Midlands and in Kent and Surrey, lectured to about 30,000 farmers.

The Committee, while recognising that care must be taken not to trench upon the rightful province of the veterinary surgeon, attach great importance to a general knowledge of the anatomy and physiology of farm animals, of how to keep them in health, how rationally to treat simple ailments, how to detect those of a more serious nature, and if such cases occur, how to act so as to assist the work of the veterinary surgeon, not hamper it by previous irrational treatment. The Committee consider that more provision should be made throughout the country for imparting by means of local lectures and otherwise such knowledge as would enable those connected with the management of stock to render "first aid" treatment.

Veterinary Education.

78. The Committee recognise that the subject of veterinary education does not strictly come within their terms of reference, but in view of the importance of veterinary science to farmers, and of the fact that the Royal Veterinary College at present receives an annual grant from the Board of Agriculture, they are of opinion that some allusion to the subject is desirable. The proper and sufficient provision for the training of future veterinary surgeons is of considerable moment to the community at large, as public authorities are called upon in an increasing degree to take action in matters demanding the advice and assistance of a veterinary surgeon.

McFadyean, 9695. McFadyean, 9730. McFadyean, 9706. 79. Sir John McFadyean impressed upon the Committee the importance of veterinary science to agriculture, and stated that if veterinary education in this country is to reach the level already attained in most Continental States, it will be absolutely necessary for the Government to assist veterinary colleges financially. He stated that unless the present revenue of the Royal Veterinary College is augmented there is "imminent danger" that it will not be able to conduct veterinary education efficiently or to promote veterinary research.

80. Most European States largely assist veterinary education. For instance, the veterinary high school in Saxony receives a grant from the State equivalent to £7,750 per annum, and that at Munich to £10,000; the Prussian schools at Berlin and Hanover receive respectively £12,000 and £7,000, while the State grants to the veterinary schools in France amount to nearly £40,000 per annum.

81. In addition to the Royal Veterinary College in London, there are two veterinary colleges in Scotland and one in Liverpool, but the first-named alone receives Government aid. At this college the annual sum paid in salaries to the professorial staff amounts to £5,000, apart from any expenditure on equipment and instruments. The Government grant to this college is £800 a year, and the Committee submit that, in view of the national importance of its work, this sum is quite inadequate.

Forestry Education.

Cd. 1319. 82. In view of the fact that a Departmental Committee have recently inquired into and reported upon the whole subject of forestry, the Committee have not considered it necessary to take evidence in respect of it. At the same time the Committee appreciate the facilities, limited though they are, now afforded for instruction in forestry, and would urge that these facilities might with great advantage be extended to other colleges as recommended by the Departmental Committee, particularly in those cases where woodlands in the immediate neighbourhood are available for practical demonstration.

Teaching of Meteorology at Agricultural Institutions.

83. The attention of the Committee was drawn to this subject as one which, up to the present time, has received but little attention in this country.

Dr. H. R. Mill, President of the Royal Meteorological Society, pointed out that the Meteorological Office has amongst its other duties that of preparing reports and weather forecasts for the British Isles, and that he was afraid that a very large number of farmers are not able to profit by this expenditure of public money on their behalf because of their inability to understand the Weekly Weather Report. Mill, 6303.

Dr. Mill holds that "imparting a knowledge of the methods of meteorology is technical instruction in agriculture to this extent, that it helps a farmer to decide difficult questions that arise occasionally as to whether he should proceed with a certain agricultural operation in certain conditions of weather, or whether there are sufficient data before him in the published reports, say, of the Meteorological Office, to justify him in postponing it on the ground that better weather is coming." Mill, 6339.

The Committee are of opinion that in agricultural and horticultural institutions, provision might well be made for instruction which would enable farmers and gardeners to make use of existing means of information regarding the weather, and direct farmers' attention to the relations between meteorology and the crops.

Teaching of Agricultural History, Co-operation, and Kindred Subjects.

84. The educational value of the history of agriculture and kindred subjects is hardly, at present, fully realised in this country. The study of the contemporary agricultural systems of other countries is also to be recommended; for instance, a knowledge of the results achieved through co-operation in dairying as well as in the collection, preparation and distribution of eggs, poultry and bacon, in certain Continental countries would prove of the highest practical value as an incentive to the promotion of co-operative methods in England and Wales. Percival, 4165-6 Wood, 109-13; Young, 1339-40.

85. The agricultural press and the agricultural articles in general newspapers exercise throughout the country an educational influence which it would be difficult to exaggerate, and the Committee feel that this influence might be usefully supplemented if circulating agricultural libraries were established in rural districts. *Refer to* Agricultural Libraries *in the General Index.*

Teachers and Instructors.

86. The sufficiency of the supply of teachers and instructors remains to be considered. While the Committee recognise the good work already accomplished, they are satisfied from the evidence that its quality would have been much improved if a more numerous and in some cases a more highly-qualified staff had been available.

The careers at present open to young men as instructors or experts in this country have hitherto failed to induce a sufficient number of the right type to undergo the necessary training, and the Committee are of opinion that this deficiency of teachers demands serious attention.

They further think that the quality of the instruction given by the colleges, both in the indoor and external lectures, has suffered from the circumstance that teachers have been required to deal with too many subjects, or in the case of agriculture with a subject too wide to be treated effectively by a single man. "Agriculture" as defined in the ordinary syllabus covers the whole range of arable and stock farming, and frequently includes such related subjects as estate management, forestry, fruit-farming and market-gardening. Of these the teacher of agriculture is supposed to possess an expert knowledge. Though there may be no difficulty in acquiring a sufficient acquaintance with all these subjects in order to pass examinations, or train students to pass them, a higher standard of knowledge is required in teachers at universities and colleges. The professor must be an expert in his subject, and his teaching must be such as will be of value, not only to the elementary and advanced student but, in the case of a subject like agriculture, to the experienced practical farmer. The evidence taken by the Committee clearly shows that the advice of the teacher is frequently sought, and it is obviously desirable that this practice should be encouraged and that the farmer when in a difficulty should learn to resort for advice with as much confidence to the agricultural expert as he now does to the medical specialist or to the skilled engineer. But if the knowledge of the teacher of agriculture is thus to be sought after, the teacher must follow the example of the teachers of similar wide subjects and must specialise. It is generally admitted that if the practical Collinge, 5064*a*, 5068. MacDonald, 11852–6, T. H. Middleton, 15448*e*.

farmer wishes to succeed he must limit his attention to certain departments of agriculture, and if this concentration is necessary on his part, it becomes still more necessary in the case of the man who is preparing himself to assist the farmer to surmount the practical difficulties which occasionally hamper his work.

In most other countries the subject "agriculture" has already been subdivided, and sections allotted to different teachers, in the same way that the subject "medicine" is treated in Britain. The Committee think that in developing the teaching of agriculture at the higher institutions in this country, the first need is for a similar rearrangement of duties.

Eve, 12993, 13008, 13051–7, 13096–100.

87. The question of the supply of itinerant instructors was also raised by witnesses. The Secretary of the Farmers' Club gave it as his opinion that, in order to disseminate information at the disposal of the colleges, a capable man should be appointed for each county of average size, whose principal duty it would be to assist farmers by means of personal advice and lectures. He pointed out that at the present time the head of the staff at a college had so much to do in other ways that he could not devote time to itinerant work of this character. At the same time Mr. Eve emphasised the importance of such an instructor being attached to some central institution.

Hall, 1531.

A system obtains in France under which there are in each *Département* two persons whose sole business it is to circulate and give information, and it was pointed out that they have had more success in getting at the "small man," and giving him information than has been met with in this country. A system similar to that in France is also to be found in several continental countries.

Campbell, 11209.

Professor Campbell described the Irish system, under which almost every county has its own individual instructor, whose selection and fitness for the post receive particularly careful attention.

The Committee suggest that in each area of the size of an average county there should be a resident agricultural adviser, to convey information and instruction to the farmers, to supervise field experiments, to give courses of lectures on the subject of such experiments and on matters of agricultural interest, and to conduct special classes. He might act as director of agricultural instruction, and should consequently be in close touch with, and responsible for, the work of other instructors in subjects such as dairying, poultry-keeping or horticulture. At the same time he should be attached to, and work in association with, a college or place of higher instruction acting for a group of counties. A good illustration is afforded by the county of Buckingham, where an instructor is appointed on the recommendation of the head of the agricultural department of University College, Reading, under whose general supervision he works. As a member of the staff the instructor is able to keep himself in touch not only with the college but with the whole area which it serves.

Childs, 3851.

88. The Committee are strongly of opinion that itinerant instructors should play an important part in the educational system of Great Britain. If well-qualified men were obtained for these positions, farmers—especially small farmers—would soon learn to go to them for advice.

Itinerant teachers have many more opportunities than college lecturers of meeting those actually engaged in cultivating the soil and thus if possessed of knowledge, practical skill and the faculty of inspiring confidence, they should rapidly influence the different branches of the industry.

The most economical and effective way of influencing practical farming is, doubtless, by influencing the farmer himself when he is young; but in any community of farmers there must be many, especially among the small holders, who have not had opportunities of learning in early life, and to whom only the spoken word or the personal example of an instructor appeals. The ordinary small farmer is not a student of books, and does not appreciate written instruction: if, then, he is to be influenced at all, it must be by such means as are at the command of the itinerant teachers.

89. While much good has been accomplished by some of the itinerant teachers whose work has come under their notice, the Committee cannot but feel that as a whole the work has suffered in the past from want of system. Classes have been held at irregular intervals often by persons who have come to and left the district as strangers, whose lack of local knowledge has discredited their teaching, and who have produced no effect on the methods of cultivation pursued in farm and garden.

The Committee think that casual classes have been sufficiently tried, and while they have been of some use for pioneer purposes in the past, their continuance is not to be recommended.

Local authorities should be encouraged to concentrate their attention upon obtaining a permanent staff of teachers. If funds are small they should prefer one permanent to several temporary teachers. As the work in one direction becomes appreciated, efforts should be made to add new permanent teachers. The smaller counties should co-operate, and share the services of permanent instructors. This could easily be arranged by the establishment of Joint Committees. To stimulate local authorities to provide capable itinerant teachers, the Committee think that grants-in-aid should be made by the Board of Agriculture.

Farm Institutes.

90. While the Committee agree that a system of agricultural education must provide for itinerant instruction and that instructors of the right type would prove of great value to agriculture, they are impressed with the difficulty of securing suitable teachers. High scientific attainments are not required, but the teacher must possess a thoroughly practical knowledge of his subject, a good store of information and capacity for teaching or demonstrating. In subjects like dairying and horticulture skill in manipulation is especially necessary.

91. The problem of the local authority in providing teachers will not only be to secure competent men, but to ensure that their practical skill is maintained, so that cultivators may, without hesitation, accept their advice and example. For the purpose of maintaining teachers at a high level of practical skill the Committee think it essential that they should be connected with some institution where on a farm or in a garden they would be in constant touch with practice. Further it would be desirable that all the teachers in a district should be as closely associated as possible, in order to assist each other in their work.

92. The Committee recommend therefore that, in those districts in which there is no suitable institution with which the county instructors could be associated, Farm Institutes should be established to serve as headquarters for the entire itinerant staff working in the district. Like the Bedfordshire Agricultural Institute, the Basing Farm School and the Farm School at Newton Rigg, these institutes should possess a farm, and class-rooms in which instruction in agriculture, dairying, horticulture, and allied subjects could be given. The farm should be laid out so as to be typical of the district, it should illustrate such points as the most profitable methods of manuring local soils; the best varieties of farm and garden crops; the best methods of rearing and feeding live stock, keeping poultry, and managing bees; the most approved methods of pruning fruit trees; the best remedies for common pests and diseases of farm crops; and, when practicable, the management of shelter belts and hedgerow timber. The general aim should be to place before farmers and gardeners an object-lesson for guidance in their work and to stimulate them to improve their methods of cultivation.

93. The establishment of farm institutes was suggested in a Report presented to the Board of Agriculture by one of their inspectors as far back as 1889, and the migratory work carried out since that date by County Councils has emphasised the necessity for such technical centres round which all work of this description in a county could be gathered and from which it would emanate. C. 6525, p. 28, quoted in Appendix I. to the Report.

The Committee urge, therefore, the establishment of farm institutes in every county or group of two or three counties to give definiteness of aim and stability to county work. They think, further, that in the majority of cases it would be desirable to combine farm institutes with the winter schools recommended in paragraphs 46–52 of the Report. In all cases the buildings of a farm institute should, during half the year, be available for winter schools. For the remainder of the year the buildings would afford accommodation for dairy students, or for the teaching of other subjects appropriate to the summer months. The county instructors with their headquarters at the institute would give some help in the winter schools, and although there might not be much to see on the land, the farm attached to the Institute could be made of some value for teaching purposes.

The establishment of farm institutes is much to be desired in the interests of small holders, to whose success they might largely contribute by providing information and advice. The combination of the winter school and the farm institute should first be attempted in those districts in which holdings of small and medium size are most numerous.

Research in relation to Education.

Refer to Research *in the General Index.*

94. The subject of original research was touched upon by many of the witnesses who appeared before the Committee. Several aspects of the relationship of education to research were mentioned, and two of these, the effect of research (i) upon the efficiency of the teacher, and (ii) on the quality of the instruction which he communicates to his pupil, were frequently referred to.

One or two witnesses held that the functions of teacher and investigator should be kept distinct, but the majority were of opinion that, in some degree at least, these functions should be united. Much, of course, depends upon the training and bent of the individual teacher; much, too, depends upon his opportunities for original work, and the Committee recognise that there may be circumstances under which any attempt to combine the duties of teacher and investigator would be undesirable; but they are strongly of opinion that teachers of agricultural science should attempt to combine investigation with teaching, and that, especially in higher institutions providing agricultural education, original work should not only be encouraged, but expected. The teacher of agricultural science should depend more than most other teachers on the results of his own observation and on his personal experience of the subjects with which he deals. If he depends upon books alone for the information upon which his lectures are based he will probably fail to stimulate his students as a good teacher should, and he will certainly fail to influence farmers who, as a class, are very suspicious of second-hand information. Even at the smaller institutions, where the number of the staff and the absence of laboratories limit the possibilities of original research, it would be desirable for the foregoing reason that systematic field experiments, and similar work requiring little in the way of special attainments or elaborate apparatus, should be undertaken.

While the Committee thus lay stress on the value to the teacher of original work, they would point out to those responsible for agricultural institutions the danger of an over-ambitious programme. Before undertaking any kind of investigation, the equipment and means at the disposal of the investigator should be most carefully considered. The effect produced on either students or farmers by original work unskilfully conducted is disastrous, and in the past has been responsible for most of the misgivings with which practical men have viewed agricultural experiments.

The danger that a teacher engaged in research might neglect his other duties the Committee do not believe to be serious. The members of the staff of an agricultural institution are usually selected because of their skill as teachers. The individual teacher, however much interested in investigation, rarely forgets that his first duty is to his students, and if occasionally he were to fail in this direction, the Committee think it unlikely that those responsible for the direction of an institution would permit research to be undertaken at the expense of the time-table drawn up for instruction.

95. More important than the effect which the prosecution of research exercises upon the teacher himself is the effect produced by research on the quality of the information which the teacher communicates to his pupil. A man who knows nothing of the methods of research may make a good instructor of students preparing for examination, but it will be admitted that even for this purpose he is dependent upon the information at his disposal. This is, of course, true in the case of the teacher of all branches of knowledge; but whereas the information which enters into elementary courses of instruction in subjects like mathematics, physics and chemistry has long been systematised and may be presented to the pupil in a comparatively perfect state, with the subjects included under agricultural science it is otherwise. Partly because these subjects have not long been subjected to systematic study, and partly because the application of scientific principles may be modified by local and variable conditions, the instruction which the teacher of agricultural science can impart is of a much less definite character than that which can be given by, for example, the teacher of chemistry. At the same time the teacher of agricultural science is required to instruct pupils who, as a class, demand simple and positive teaching. Farmers, whether youths listening to lectures, or adults asking advice on practical points, like to get information directly applicable to their own cases; they ask to be told what is best, not what is best under given conditions.

The Committee have carefully considered this subject in view of the evidence of those witnesses who complained of the quality of the instruction offered to farmers, for it appears to them that here may be found the reason why practical agriculturists so often disbelieve in technical education. The Committee do not consider that the disbelief is due to the farmer's fear of innovations, or to any inherent distrust of theory. It is true that dislike of change accounts to some extent for the relatively slow progress which agricultural

education is making in England; but the real and serious hindrance to progress is that the farmer does not always trust the teacher's information. If he is asked why, he says that he has tested and found it wanting, or that his previous training and experience tell him to beware of it, or that he has heard experts contradict each other. Several witnesses examined on this point testified to a change in the attitude of farmers to technical education, and attributed it to the superior quality of the information now given.

Refer to Attitude of Agriculturists *in the General Index.*

While the Committee are agreed that a marked improvement has taken place in the quality of the instruction offered, they must point out that while in some departments of agriculture the knowledge at the disposal of the teacher is now of a fairly satisfactory kind, in other departments it is still unsatisfactory, and the farmer has too much reason for his misgivings.

96. Allusion has already been made to the effects of research on education in Germany and America, and it has been remarked that as the results of research become known to farmers their appreciation of education increases. In this country the same is true, and round those institutions at which experimental work has been properly conducted numbers of farmers may be found keenly interested in the new facts which each year brings to light. A satisfactory beginning has been made, and if development proceeds on the lines indicated by experience, a satisfactory result will be obtained.

For the purpose of improving and extending a knowledge of the application of science to practice, and thus of increasing the appreciation of education by agriculturists, the Committee are of opinion that further provision for research is urgently required. The need is not so much for new institutions as for a greater number of men, and they recommend that before any further stations for research are established, existing institutions, whether special experimental stations such as Rothamsted, or experimental stations at teaching centres such as Cambridge, should be enabled to increase their staff of workers.

In view of the considerations stated above, the Committee think that it would be unwise to develop any extensive system for providing instruction in agriculture in Great Britain without at the same time providing for research so as to lay the foundation which all experience has proved to be necessary for a successful result.

97. Several witnesses drew attention to the economic value of research in agriculture. The Committee believe that a good case might be made out for expenditure on agricultural research as a national investment, but as their terms of reference include only those aspects of research which may be classed as educational, they do not propose to examine the estimated profits which might accrue from expenditure on investigations in such departments of agriculture as the breeding of plants and animals, the manufacture of dairy produce, or the treatment of disease. Attention may, however, be called to the effect on agricultural education of the extensive provision for research on economic subjects which is made in other countries. In Germany, for example, there are between seventy and eighty stations engaged in economic research, and though many of them are quite unconnected with educational institutions they all aid education by providing employment for men who have studied agriculture at colleges and universities. Further, the majority of the workers at these stations, by their writings and by their personal interest in the subject, promote the study of agriculture. Any development in this country of research for economic and commercial purposes would doubtless be followed by similar results, and money spent in fostering such research would indirectly benefit agricultural education.

Refer to Research —the need for further research, *in the General Index.*

Beaven, 14143-50; T. H. Middleton, 15449f.

Minor Experiments.

98. A great many experiments on crops and livestock have been conducted under the supervision either of county instructors or of the teaching staff of the colleges. The greater number of these experiments have been arranged for the purpose of testing the manurial needs of particular soils, and for demonstrating to farmers the characteristic effects of nitrogenous, phosphatic and potassic manures. In other cases field experiments have been made on new or improved varieties of crops or on new cultural processes. In the experiments on live stock most of the common concentrated feeding stuffs have been subjected to careful tests, and the special uses of a number of mixed rations investigated. Experiments of the type indicated can be made of much use for educational purposes if the issues are kept direct and simple.

A number of the witnesses referred to the value of this class of experiment, not only for the purpose of obtaining information on local agricultural problems, but as a

Refer to Experiments *in General Index.*

means of attracting the attention of farmers to the work of agricultural institutions. It was frequently stated by those giving evidence that farmers took more interest in experiments than in any other class of work undertaken by the colleges, and the Committee agree that the teacher has no better means of getting into close touch with the farmer than by laying out for his inspection a series of experimental plots designed to elucidate some local question.

Other witnesses suggested that more of such demonstrations were wanted, in order to repeat in different parts of a county the experiments conducted at a college farm. The Commitee are of opinion that it is desirable that central experimental stations, not too limited in area, should be established in connection with every place of higher agricultural education, and also in every county subsidiary stations where demonstration rather than experiment should be the principal object, the results obtained at all such stations being carefully correlated.

99. Many witnesses referred to the need for better organisation in connection with these minor experiments, and while a good deal of the criticism to which the present system was subjected appeared to be due to an imperfect knowledge of what is actually being done there can be no doubt that by better organisation the quality of this work might be much improved.

An attempt was made in this direction some years ago by the Board of Agriculture. A set of typical schemes for experiments was compiled through the agency of the Agricultural Education Association and circulated to all interested in the subject. While some institutions have accepted and used these schemes others have not done so.

100. Professor Campbell in comparing experimental work in this country and in Ireland commented unfavourably upon the absence of uniformity in English methods, both in field work and in reporting the results. While the conditions of agriculture in Ireland and in this country are very diverse the Committee think that the subject is one to which the Board of Agriculture should direct attention. They are of opinion that in view of the large number of agricultural experiments and the number of reports which appear each year the farmer ought to derive more assistance from this branch of the work of institutions subsidised by the Board than he now does. The common system of reporting each year on a particular experiment, while it may help to keep up local interest, is of doubtful value. Seasons have so great an influence on field experiments that the conclusions of one year frequently have to be modified in the next, and while this may prove no disadvantage to the close student of the subject, it is apt to confuse farmers, and to mislead rather than to assist them.

It would usually be a great advantage if the results of field experiments were only published after the figures of three, four or five seasons were available, or possibly after two years in those cases where a number of similar experiments were made in a district in each season. The results of the more important experiments should be summarised at regular intervals, and might then be published in the *Journal of the Board of Agriculture* so as to be available to the agricultural public generally. While the first object of the agricultural institutions aided by the Board of Agriculture should be to provide education for a particular district, it must not be forgotten that as each institution is subsidised by the State, so also it owes a duty to the State.

See Para. 120.

The Committee think that at the periodical revision of the grants made to these institutions, account should be taken of the extent to which their experimental work and publications have been made available for, and have proved useful to, the general agricultural public.

In view of the large sums spent upon experiments, and of the important influence which they ought to have upon agriculture, the Committee are of opinion that the Board of Agriculture should give very special attention to collating the results, comparing them with the results of similar work conducted in other countries and extracting and publishing such facts as may have a direct bearing on the practice of agriculture in this country.

Analytical Work at Teaching Institutions.

101. In connection with experimental work the chemists at teaching institutions must frequently make analyses of manures and feeding stuffs. In some cases those responsible for this work have gone further and made analyses of manures and feeding stuffs for farmers at a cheap rate. These analyses have been undertaken in order to induce farmers to pay more attention to the character of the materials which they buy for fertilising the soil or for stock feeding, and the object of the institutions has primarily been educational.

The educational value of this work in some districts is undoubted, and evidence was given of the appreciation shown by farmers of such assistance. On the other hand it was argued by Dr. J. A. Voelcker in his evidence, and also in a communication received by the Committee from the Institute of Chemistry, that college teachers by performing these analyses were undertaking commercial work, and that colleges should not use money granted for educational purposes to do work of this character.

Refer to Analyses *in the General Index.*

The Committee, while of opinion that analysis for commercial or trade purposes forms no part of the function of an agricultural college in receipt of State aid, consider that when analytical work is distinctly of educational value it may properly be carried out by the chemist at such an institution.

Scholarships.

102. The Committee attach great importance to the provision of facilities enabling capable young men and women, of limited means, to obtain the technical and scientific instruction in agriculture afforded by the existing universities and other institutions. This can be secured by the establishment of scholarships, forming links in the chain of a complete system of agricultural education. Agricultural and other societies and private individuals, as well as local authorities, might well consider the advantage of assisting such a system. Some institutions have ample accommodation for a larger number of students than are at present in attendance, and the establishment of scholarships would, while conferring great benefit upon the holders, materially increase the efficiency of the colleges, and enable counties not associated with such institutions to secure the advantages they afford without the labour and expense of establishing, equipping and maintaining them. The Committee are of course aware that in some cases county councils do offer such scholarships, and they have received evidence as regards the scholarships awarded by the Surveyors' Institution. They think that the system might with advantage be widely extended.

Langridge, 10896-901, 10970-7.

It is often an advantage to a student before settling down on a farm to come into contact with other methods of farming. On one occasion a county council awarded a travelling scholarship, enabling the holder to study systems of farming in different parts of the country. The Committee are of opinion that this example should be widely followed.

Essex.

To make a system of scholarships useful and thoroughly successful in practice it is of the first importance that ample opportunity and information should be given to all those for whom the scholarships are intended. Both the intellectual qualifications and the financial circumstances of a candidate should be considered before a scholarship is awarded to him, and in the event of no qualified candidate applying, no scholarship should be awarded.

103. The Committee strongly urge that the Board of Agriculture should provide—as is done in other countries—scholarships enabling the holder to undertake post-graduate research, and also travelling fellowships to enable teachers and other suitable persons to study agriculture abroad.

McCracken, 9260–2; Hamel-Smith, 8973–7, 8977; Winter, 6663*d*, 6672–3, 6807–9.

III.—STATE CONTROL AND LOCAL ADMINISTRATION.

104. The Committee have now dealt with the general history of agricultural education in this country, traced its development and endeavoured to show the position which it occupies at the present time; they have referred to the work conducted by the various collegiate and other permanent institutions, as well as that carried out by County Councils. It is now desirable that they should state their opinions as to the Department of State by which this work should be promoted, supervised and assisted.

Board of Agriculture and Board of Education.

Refer to Organisation—Government Department *—in the General Index.*

105. The evidence showed a general desire that the work of agricultural education should be continued and expanded by the Board of Agriculture. On the other hand, Mr. F. Grant Ogilvie, C.B., of the Board of Education, who fully explained the aims of that Board as regards rural education in elementary and secondary schools, and also their recent work in respect of technical instruction in agriculture, expressed a contrary opinion.

The Board of Agriculture under the Act of 1889, by which it was established, was empowered to "undertake the inspection of, and reporting on, any schools which are not public elementary schools, and in which technical instruction, practical or scientific,

Board of Agriculture Act, 1889. (Section 2, Sub-Section 2.)

is given in any matter connected with agriculture or forestry, and the aiding of any school which admits such inspection, and in the judgment of the Board is qualified to receive such aid, and the aiding of any system of lectures or instruction connected with agriculture or forestry, and the inspection of and reporting on any examinations in agriculture or forestry;" and in the exercise of the powers thus given the Board has laid the foundation of the existing system of agricultural education. By the Act of 1899, which constituted the Board of Education, the Sovereign in Council was empowered "from time to time, by Order, to transfer to, or make exercisable by, the Board of Education any of the powers of the Charity Commissioners or of the Board of Agriculture in matters appearing to Her Majesty to relate to education, and the Order may make such provision as appears necessary for applying to the exercise of those powers by the Board of Education the enactments relating to the Charity Commissioners or to the Board of Agriculture." Up to the present no transfer of the powers of the Board of Agriculture has taken place, but Mr. Ogilvie stated very clearly that in his opinion (without pledging the Board which he represented) the time for such transfer had now arrived. This opinion he based very largely on the consideration that the Board were endeavouring to systematise the technical education in each county as a whole, and to make a block grant in respect of it; they would not, therefore, consider the educational provision in any county complete if it did not include agricultural instruction suitable to the district. The Act of 1902 empowered the Board of Education to deal with the education in a county as a whole; but their connection with the technical agricultural education provided by county councils is still more recent. Grants for classes in various subjects, such as dairying, poultry-keeping, and the like, have been made during the last two or three years only. Certain permanent institutions, several of which were already in receipt of aid from the Board of Agriculture, have also received aid from the Board of Education. The former Board, in consequence of the recommendations of the Royal Commission on Agriculture in 1897, have since 1899 inspected and issued an annual report upon the agricultural instruction provided by county councils in England and Wales. There is thus considerable risk of over-lapping, as already observed by the Departmental Committee on the Fruit Industry. The present Committee consider that in the interest both of efficiency and of economy the respective spheres of influence of the two Departments should be defined.

Board of Education Act, 1899. (Section 2, Sub-Section 2.)

Cd. 2589, p. 11.

106. After carefully examining the subject in all its bearings the Committee have come to the conclusion that scientific and practical instruction in agricultural subjects, when provided by universities, university colleges, agricultural colleges, farm institutes and winter schools, or by means of special classes or courses of lectures in agriculture and kindred subjects (*e.g.*, dairying, horticulture) should be under the direction of the Board of Agriculture; while all instruction in agricultural subjects forming part of courses of study in primary, secondary or such evening schools as are in definite continuation of the education given in primary schools, should be under the Board of Education. In some cases the subjects taken up by scholars attending evening classes would more appropriately be dealt with by the Board of Agriculture; but as the evening work would usually be carried on by teachers from day schools, it would, in the opinion of the Committee, be on the whole more convenient that their work should be inspected by officers of the Board of Education.

107. In coming to the foregoing conclusions the Committee must not be supposed to undervalue the good work which the Board of Education are now doing in rural districts. They note with satisfaction the increasing importance which the Board attach to agricultural facts and principles for purposes of the mental training of children, and they anticipate good results from the recent changes in the Code and Syllabuses. So long as agricultural subjects are merely used for giving a "rural bias" to education in primary and secondary schools the Committee agree that the supervision of the Board of Agriculture is unnecessary. While a lad remains at school the success of his education depends chiefly upon the use of suitable methods by his teachers. It is not so much what the schoolboy learns, as how he learns, that makes the difference between a good and a bad training; and thus, since much more depends upon system than upon subject, it follows that school education in rural districts should be regulated by the Board which regulates school education in towns. Any attempt to differentiate between the control of rural and urban elementary schools would be educationally unsound, and probably lead to much expense and confusion.

Ogilvie, 16065-6.

But when the educational problem is the provision of suitable higher and technical instruction the conditions are quite different; the success or failure of the education offered in this case depends chiefly on the quality of the information available. The subject matter is then all-important and as it becomes necessary to make separate

provision for the training of agriculturists, separate control does not entail inconvenience or extra cost. Further, it is all important that the authority supervising agricultural education should be in close touch with agriculturists, and should possess their confidence, for unless their confidence is gained progress will not be made. The young agriculturist is not in the position of the professional man, who must obtain a diploma before being permitted to practise, but is free to enter on his career without passing an examination, and therefore, apart from social considerations, the question of whether or not he will seek further education depends upon the value which he or his parent may learn to attach to the instruction provided for him.

108. It has already been pointed out that neither in Germany nor in America did agricultural education make material progress until farmers in those countries were convinced that the instruction offered them was of practical value. Also in England by similar means a change in the attitude of farmers is being brought about. The Committee have indicated how this change may be accelerated. Schemes and syllabuses, even when accompanied by inducements in the shape of substantial state grants to the local authorities, are not likely to make agricultural education popular with the classes for whom it is intended. This object will be accomplished by the creation of a system of education ensuring a supply of tested information upon which farmers may rely, and of capable teachers and advisers to whom they may apply. In forming an opinion as to which of the two Boards should be entrusted with the supervision of agricultural education, the Committee have considered the means at the disposal of the two Departments, and also their systems of making grants; they have further considered the administrative points raised by Mr. Ogilvie. So far as the interests of the public are concerned, either Board might be entrusted with the inspection of institutions, and the distribution of grants, for both may be trusted to dispense public funds with fairness and caution. But as the Board of Agriculture are in daily contact with the practical and ever-varying problems of agriculture, the Committee think that in dealing with agricultural education in both its higher and in its purely technical aspects, the knowledge possessed by that Board would give them a great advantage in co-operating with and in aiding the local authorities under whose immediate supervision would come nearly all the institutions providing agricultural instruction.

109. As Mr. Ogilvie pointed out, our educational system leaves great power in the hands of the local authority, which in England is entrusted with the expenditure of most of the money allocated to agricultural education; and as its development must largely depend upon the wisdom with which these funds are expended, the Committee think it essential that the local authority should be in direct contact with the department of state which possesses expert knowledge of, and machinery for ascertaining, the needs of those for whom agricultural instruction is provided. It is essential that instructors in agriculture and kindred subjects employed by county councils, as well as teachers in the higher institutions, should be directly associated with the Board of Agriculture in their educational as well as in their experimental and field work. It is generally agreed that research and experimental work must be conducted under the supervision of the Board of Agriculture, and it would be practically impossible to separate work of this kind from education. But even if it were possible the Committee believe, for reasons already stated, that it would be highly undesirable.

110. It does not appear to the Committee that any serious administrative difficulty would arise through the adoption of their proposals. If education committees were restricted to dealings with one department of state there might be some diminution in clerical work, but this is not a consideration to which, in the circumstances, much importance need be attached. Local authorities are now in the habit of communicating with different state departments, and are well aware in which department is vested the supervision of any section of local work.

111. The question as to which department should control agricultural education is not confined to this country. The same problem has been presented to the Governments of other countries, and has usually been decided in the way above suggested. Mr. Moreland, the Director of the Department of Land Records and Agriculture for the United Provinces of Agra and Oudh, furnished the Committee with an interesting memorandum, in which he points out that one of the reasons why the Cawnpore Agricultural College was placed under the control of the Agricultural Department was the desirability that the authority which directs the training intended to fit students for a few specified careers should be thoroughly conversant with their needs. "This consideration," he added, "has been accepted in the United Provinces for other branches of technical education

which are to be organised under a department acting distinct from that which deals with general education."

112. Apart from the considerations above mentioned there are important reasons why the Board of Agriculture should continue to control agricultural education. It is obviously the duty of a Department of Agriculture to direct and stimulate agricultural organisation and development. Agricultural education forms the basis of all action in this direction. The Committee, therefore, would deprecate any attempt to sever the control of agricultural education from that of agriculture itself.

Rogers, 15152-62, 15277—80.

It would be difficult for the Board of Agriculture to carry on a large portion of their work unless they were in close touch with agricultural experts in every district. The Committee have heard with much interest from the head of the Intelligence Branch of the Board of the efforts made to obtain information from the best authorities at the different colleges throughout the country. Occasions constantly arise when it is necessary for the Board to obtain the best expert information, which can readily be obtained from educational institutions with which the Board are officially associated. If the association of the Board of Agriculture with agricultural education were severed it would be necessary for them to provide their own research stations, at very large expense, in order to be in a position to meet the demands for information and advice. Not only should the Board be in touch with the higher colleges and other institutions, but also with the county or other instructors who are in constant contact with all parts of their districts.

Again, duties have been placed by Parliament upon the Board, especially under the Small Holdings Act, 1907, which appear to this Committee to be so intimately associated with and dependent upon scientific and practical education that a portion of the benefit of that Act would be endangered if the Board of Agriculture could not exercise an active control over agricultural education.

113. The Committee have discussed this question at length, as they deem it of grave importance to the agriculture of this country, and have arrived at the conclusion that, since Parliament has recognised the supreme importance of agriculture to the nation by creating a separate Department of State to look after its special needs and requirements, to this Department should the care of agricultural education be entrusted. If the present powers of the Board of Agriculture as to education were taken away its utility and influence must be impaired. In view of the difficulties which have of late attended the agricultural industry, of the recent effort of the State to remedy and to minimise those difficulties by the establishment of the Board, and of the confidence which the agricultural community have come to place in it, any reduction of its powers would be a retrograde step.

Local Organisation.

114. It appears to the Committee that the whole question of putting agricultural education on a broad and national basis depends entirely, on the one hand, upon a more complete organisation, involving thorough co-operation and co-ordination of work between the central department and local authorities, and, on the other, upon adequate funds to enable that organisation to be effective.

115. Moreover, just as the Committee consider it very important that agricultural education generally should be under the supervision of the department which is in close touch with, and has the confidence of, farmers, so in their opinion is it equally important that the work in each county should, on behalf of the county council, be in charge of representatives of agricultural interests.

Fitzmaurice, 7840.

Lord Fitzmaurice, for many years chairman of the Wiltshire County Council, gave evidence on this point and described the plan which was adopted in that county in 1895 of appointing a separate agricultural education committee, and he explained that on the passing of the Education Act of 1902 the council re-appointed this committee under the powers conferred by Section 17, and entrusted them with all matters connected with agricultural education, except the teaching of gardening in primary schools. He further stated that the agricultural education committee and the general education committee come to an agreement every year as to the proportions of the money received by the council under the Customs and Excise Act, and of the rate levied for higher education to be allotted to each committee respectively. This is done subject to the general control of the finance committee of the county council before which all the estimates go, and by which they may be amended. When, however, the agricultural education committee has its quota, it expends it without further reference to the general education committee, and reports to the county council direct.

Fitzmaurice, 7840*b*.

Fitzmaurice, 7840*f*.

In Wiltshire, by re-appointing the members of the agricultural education committee

to be the statutory committees dealing with the Fertilisers and Feeding Stuffs Act, the Diseases of Animals Acts, Small Holdings, and other agricultural matters, the county council have succeeded to a certain extent in consolidating the whole of their agricultural work. One of the advantages of such an agricultural committee is that farmers in the county look upon it as their own committee, and take a real interest in its work. Lord Fitzmaurice gave it as his opinion that an agricultural committee, such as this, has great advantages over a sub-committee of the education committee, in that it attracts many persons who otherwise would have no special interest in education, and also that it undoubtedly arouses more interest and induces better attendance than several separate committees with shorter agenda papers.

116. The Committee have obtained information from the council of each administrative county in England and Wales as to the committee or sub-committee by which agricultural education is controlled or supervised. From these returns, summarised in Appendix II., it is clear that the extent of the provision for agricultural education in each county bears a close relation to the extent to which the powers and duties of the council in this respect are entrusted to a special committee or sub-committee or its equivalent. Appendix II. of the Report.

In the Midlands the governing body of the Midland Agricultural and Dairy College, representing the counties which established and maintain the college, organise and direct the principal part of the work of agricultural education within the area of the counties. The governing body is appointed by the four county councils, with the addition of some representatives of agricultural societies.

In Yorkshire all education bearing upon agriculture, from garden plots up to the degree course at the university, is under the management of a joint agricultural council for the three Ridings.

In North Wales a distinct and useful system obtains. Agricultural education is placed in charge of a special committee in each county consisting half of members of the county council or the county education committee and half of members nominated by the University College of North Wales, Bangor.

117. Each county may be left to adopt the system best suited to its own requirements, but the Committee would lay stress on the expediency of there being in every county a special committee, or its equivalent, to organise and to supervise agricultural education. It is, moreover, essential that in order to gain the confidence of the farming classes any such special committee should include a large proportion of members engaged, or directly interested, in agriculture or its allied industries.

Finance.

118. The Committee understand that a deputation from the leading institutions in receipt of grants was received by the Board of Agriculture in December, 1905, and expressed the opinion that the work was being hampered by insufficient funds. From their own enquiries the Committee are convinced that the funds at present devoted to the provision of agricultural instruction, whether in collegiate or other institutions or through the medium of county councils, are wholly inadequate for maintaining that work efficiently. They are, therefore, of opinion that, irrespective of any further developments, further means should be provided for this purpose.

It is obvious that effect cannot be given to the recommendations of the Committee unless additional resources are forthcoming.

The Committee consider that the increasing interest of farmers in agricultural education—both scientific and practical—justifies a larger expenditure by the State. The present annual expenditure is extremely small, measured either by the requirements of the case or by the sums devoted to the purpose in other countries.

119. There are but two main sources from which funds are derived for providing agricultural instruction, viz.: (1) the national exchequer, and (2) funds administered by local authorities. To deal first with the latter. Ample and uncontradicted evidence has been laid before the Committee to prove the difficulty there is in every county in obtaining money for agricultural instruction. Increased powers and duties are constantly imposed by Parliament upon county councils, unaccompanied by any corresponding increase of funds to meet the increased expenditure. Large sums are now required for elementary education and for highways, with the result that the rates for these objects have in most counties largely increased, and as a consequence county authorities are very reluctant to propose a rate or to increase the existing rate for higher (including agricultural) education.

Especially would the Committee draw attention to the effect of the Education

Act of 1902. A result of that Act has been to oblige every county to devote larger sums of money to secondary education, which now includes the training of pupil teachers At the time of the passing of the Local Taxation (Customs and Excise) Act, 1890, it was not contemplated that expenditure on such objects would be chargeable on the funds received by county councils under that Act. The effect of the Act of 1902 in reducing the amount allocated by county councils to agricultural education has been remarked by numerous witnesses, and is conclusively proved by the fact that the amounts spent on this subject by the county councils in England and Wales during the last few years, taken in the aggregate, show a steady decline.

120. It is therefore obvious that the principal, if not the only, source from which the balance of the funds required can be obtained is the national exchequer. Any State subsidy should be devoted to two main purposes.

First, to increasing the efficiency of institutions of higher rank already established and aiding the establishment of such others as may be required. How the Board of Agriculture should allot its grants so as best to accomplish this purpose is a question which had evidently been considered by several witnesses. The Committee have arrived at the conclusion that no one test as a basis for the allocation of grants would be likely to work fairly. They suggest that, in future, the Board should adopt the method employed by the Treasury in awarding grants to universities and university colleges, and appoint periodically a committee consisting, say, of three persons. This committee would visit each institution, enquire into every circumstance in connection with its agricultural work (*e.g.*, number of students, staff, salaries, funds provided by county councils, scheme of work in the district served, and general efficiency and influence of the institution), and recommend to the Board of Agriculture what grant should be made. The amount so awarded would, unless in very exceptional circumstances, remain constant for the succeeding period of, say, five years, after which it would be re-considered by the visiting committee.

Secondly, any subsidy by the State should be employed by the Board of Agriculture in stimulating county councils in the development of their agricultural work, so that provision might be made in each county for all useful subjects of instruction, and permanent institutions, such as winter schools and farm institutes, established, round which that work should be gathered. The Committee are fully aware that the establishment and maintenance of such institutions must, in this country as in Ireland, necessarily involve considerable expenditure. This, however, they believe would be amply justified by the resulting benefit to agriculture. If such a system were adopted, each part of the country, whether local funds were large or small, could be well-equipped as regards agricultural education. At the same time, by giving the Board of Agriculture a voice in the arrangement of local work, it would be possible so to connect all grades and types of institutions in each district as to construct a well-organised and comprehensive system of national agricultural education. By this means the recommendations made by the Royal Commission in 1897 would be carried into effect.

See par. 10.

Campbell, 11183. The evidence of Professor Campbell has a special interest in this connection. He stated that the Department of Agriculture in Ireland have a very efficient system whereby the Department make grants to county councils conditional on the raising of a rate, and exercise full control over everything spent by the county committees. He asserted that the system adopted in Ireland is infinitely superior to that obtaining in this country, a fact which this Committee fully recognise.

Refer to Expenditure—Board of Agriculture, *in the General Index.*

121. It has been suggested by several witnesses that, with a view of improving the system in this country, some power of control should be given to the Board of Agriculture over such proportion of the funds accruing to county councils under the Local Taxation (Customs and Excise) Act, 1890, as might fairly be considered adequate for agricultural education. These funds, however, were definitely given without any mention of State control and, although undoubtedly when the Act was passed a great opportunity was lost, yet the Committee think that county councils would have some excuse for complaint if an attempt were now made to impose it. On the other hand, county councils are already quite willing to listen to any advice tendered by the Board of Agriculture, as regards their work, and would doubtless comply with any reasonable conditions which the Board might lay down if coupled with the grant of financial assistance.

Hobhouse, 4975. As Mr. Henry Hobhouse pointed out, " much more weight is given to the advice of a Government Department if it is accompanied by a promise of funds," and the Committee think that the time is opportune for laying the foundations of a system which would draw the Board of Agriculture and local authorities together, and enable them jointly to organise and to conduct agricultural education.

It is, indeed, quite possible that a system not unlike that obtaining in Ireland might eventually and gradually be evolved, and State assistance made more or less dependent (according to the character of the work undertaken) on the amount provided locally.

National Organisation.

122. In the national organisation of agricultural education the Committee suggest no drastic or sudden change. The system already begun should be completed by the provision, where feasible, of higher institutions for such counties as are not yet associated with universities and university colleges, and by the gradual establishment throughout the country of institutions of a less advanced character, such as farm institutes and winter schools, in close connection with those of the higher class, in order that adequate facilities for each grade of instruction should be provided in every district.

The broad lines on which such a system might be based would be for the country to be divided into large districts consisting of a number of counties, in such a manner that in each there would be a university or university college with an agricultural department. This institution would, as at present, act as the centre for the district and supply the highest teaching and expert advice; but all the counties in the area would be connected with the centre, not in any loose manner, as is frequently the case now, but as component parts of a regular system. Within some of these districts there would be one or other of the agricultural colleges already established, but in all of them there would be farm institutes with winter schools, each working for smaller groups of counties, but connected in a definite manner with the university or university college, and deriving from it the requisite scientific assistance.

Through the members of the staff of the agricultural colleges and institutes, in conjunction with the staff of the university college, all the local work for the county councils in the district, *e.g.*, lectures, classes, field experiments, &c., would be carried out. It would, however, be essential that all institutions within the area should be so connected as to form an organised system for the district.

123. In Ireland there are two bodies connected with the Department of Agriculture in Dublin. The first of these is a Council of Agriculture, of which two-thirds of the members are nominated by the county councils and one-third by the Department. The Council has no power of administration, but meets twice a year to criticise the work of the Department, and virtually to act as a Consultative Committee. The second body is the Agricultural Board, consisting of eight members selected from the Council and four nominated by the Department. This Board meets once every two months, or more often if necessary, and votes the funds required for schemes originated by the Department, subject to any revision which may be necessary.

Campbell, 11344–49.

The Committee suggest that it would be of advantage if a Consultative Committee were formed in England to advise the Board of Agriculture on all matters relating to technical and scientific instruction in agriculture. Such a course would have the effect of drawing together local and national authorities and of carrying on agricultural education in complete harmony with local needs.

Refer to Organisation—Permanent Consultative Committee, *in the General Index.*

124. The Committee think that the Agricultural Education Association, whose membership is at present confined to those engaged in agricultural teaching or research, should prove of considerable value in organisation, and that, if it received more encouragement from the Board of Agriculture and from governors of teaching institutions, it would be capable of exerting—as an analogous association in the United States of America exerts—a powerful influence over the development of agricultural education.

Page 606 of the Minutes of Evidence.

Report on Agricultural Education in U.S.A., by Esmé Howard.

125. Many witnesses referred to the Honorary Agricultural Correspondents of the Board of Agriculture, and the Committee are of opinion that they might with advantage be supplied with the official educational publications issued by the Board of Agriculture in order that they may more effectively stimulate among agriculturists the appreciation of agricultural education.

Refer to Board of Agriculture and Fisheries, *in the General Index.*

126. It is clear from the evidence that the Board of Agriculture, acting under the powers conferred upon it by the Act of 1889 previously mentioned, has been instrumental in effecting a great improvement in the means, the methods and the volume of technical and scientific agricultural instruction. The staff employed by the Board is limited even for present requirements. But further progress must be made; for instance, it is of great importance that experimental and research work should be more thoroughly organised than at present. If this steadily increasing amount of work is to be adequately dealt with a considerably increased staff will certainly be required in this branch of the Board.

See par. 100.

SUMMARY OF PRINCIPAL CONCLUSIONS AND RECOMMENDATIONS.

127. The principal conclusions and recommendations of the Committee may be summarised as follows :—

Par. 29. (1) During the past twenty years—the period covered by this Report—the foundations of a national system of agricultural education have been laid in England and Wales.

Par. 36. (2) In view of the strong support now given to agricultural education by the University of Oxford, it is in the national interest that the State should make an annual grant to the University similar to that made to other universities with fully-equipped agricultural departments.

Pars. 38, 40 and 45. (3) When this has been done, and after certain developments adumbrated in Paragraphs 38 and 40 have been carried out, the number of institutions providing higher instruction in agriculture will probably be sufficient.

Pars. 32 and 118. (4) Most of the institutions have been but recently founded, and are not yet fully developed. Future expenditure on higher education should provide for the better equipment of existing institutions, rather than for an increase in their number.

Par. 86. (5) In developing the existing facilities attention should be first given to securing a highly qualified staff. Many institutions employ too few teachers, or relegate the teaching of important subjects to junior members of the staff. It is of special importance that high qualifications should be secured in the teachers of such subjects as agriculture, agricultural chemistry and agricultural botany. The staff of the higher institutions should include men who are not only capable teachers of, but recognised authorities on, these subjects.

Par. 86. (6) Further developments in agricultural education will be difficult until a greater supply of well-qualified teachers is available. This is a subject which demands the serious consideration of the Board of Agriculture.

Par. 31. (7) In view of the State's limited expenditure on agricultural education and of the short time for which the institutions have been at work, the practical results have been satisfactory. The attitude of farmers, which was formerly one of indifference, has undergone a marked change ; keen interest is now taken in the work of many of the institutions ; and a number of improvements in farm practice can be directly traced to their influence.

Par. 45. (8) The facilities for agricultural instruction of a lower grade are unorganised, unsystematic, and wholly inadequate.

Very few institutions giving instruction of this grade exist, and if satisfactory provision is to be made, their number must be materially increased.

Pars. 51 and 52. (9) The type of institution which appears to be exceptionally adapted to the needs of this country is the Winter Agricultural School. This school should aim at providing courses of study, during the winter months, for lads of from 17 to 20, who have already gained some practical acquaintance with agriculture or horticulture. In the course of the next ten years from 50 to 60 of these schools should be provided in England and Wales.

Par. 41. (10) Excellent work has been done in certain districts by means of short winter courses held at colleges. These courses have provided instruction for the same class as would attend the winter agricultural schools, and their success indicates that similar instruction would be welcomed by young farmers, if generally available.

Par. 53. (11) Good work has also been done by local winter classes, which should be encouraged until longer and more systematic courses of instruction are available at winter agricultural schools.

Pars. 61, 62, 63, 70, 74, 75, 77, 84, 87-89. (12) As a means of reaching and influencing those engaged in farming or gardening the itinerant instructor is of great importance. In every county there should be instructors in agriculture and horticulture, and systematic instruction should also be provided in farm hygiene, dairying, poultry-keeping, farriery and certain manual processes, as well as in the methods of co-operative production and distribution.

Pars. 90-93. (13) In order to secure and to maintain efficiency the instructors selected must have had practical experience, and must keep up a close association with practical

work. They should have their headquarters at a centrally situated Farm Institute, so that each teacher may on the farm or garden or in the farm-buildings arrange for systematic demonstration of improved practice, and so that the work of all the itinerant teachers may be co-ordinated. Farm institutes should be combined with winter schools so that the same buildings, and to some extent the same staff, could be utilised by both.

(14) Between all agricultural institutions working in a particular area there should be some definite connection, so that the aid and influence of higher institutions may be given to workers in winter schools and farm institutes. Par. 40.

(15) For the development of British tropical and sub-tropical colonies a number of agricultural experts are required. It would greatly assist in the provision of suitable men if a Readership or Lectureship on Tropical Agriculture were established at one or more British universities. Par. 35.

(16) In view of their importance, not only to this country but to the Colonies, horticultural institutions and horticultural departments of colleges should receive encouragement. Pars. 66, 68.

(17) It is desirable that universities and colleges in receipt of aid from the Board of Agriculture should provide courses of instruction in subjects bearing upon agriculture and horticulture for elementary and secondary school teachers. Par. 43.

(18) The courses of instruction in forestry now offered by certain agricultural colleges are of much value, and should be encouraged. As opportunity offers similar courses should be established by other institutions. Par. 82.

(19) At institutions providing instruction in dairying more attention should be given to the breeding and rearing of dairy cattle, the keeping of full milk records, the production and sanitary distribution of milk, and to possible improvements in methods of milking. Par. 60.

(20) In view of the importance of veterinary education, not only to owners of live stock but to the public, the State aid given to this branch of agricultural education is inadequate, and should be largely increased. Par. 81.

(21) Increased provision for original research is urgently required in the interests of agricultural education. Par. 96.

(22) Much good has resulted from the field experiments and demonstration plots arranged by various institutions and local authorities; but more public advantage would accrue from these experiments if they were systematised. Pars. 98, 99.

Field experiments and demonstration plots should be placed in charge of men who combine scientific accuracy with practical experience of farming, and are in touch with the farmers of the district. Par. 91.

(23) An increase in the number of fruit stations and of demonstration plots for other horticultural purposes is desirable. Par. 70.

(24) The Board of Agriculture should collate the results of the experiments conducted throughout the country, and publish those directly bearing on the improvement of agricultural practice. Par. 100.

(25) The advantages offered by scholarships have not been fully utilised. Greater efforts should be made to provide scholarships in connection with well-arranged courses of study, and to secure a good competition for the scholarships offered. Par. 102.

(26) The Board of Agriculture should provide or encourage the provision of scholarships for post-graduate research, and also travelling fellowships for teachers, enabling them to study foreign systems of agriculture. Par. 103.

(27) With regard to the organisation of agricultural instruction the Committee are of opinion :— Pars. 114, 122.

That, so far as the national authority is concerned, the duty of promoting and controlling agricultural education should remain vested in the Board of Agriculture. Pars. 106, 113.

That, so far as control by local authorities is concerned, the organisation and supervision of agricultural instruction should always be entrusted either to a special committee; or to a sub-committee reporting direct to the Par. 117.

education committee of the county council, and consisting principally of agriculturists and of representatives of the college to which the county may be affiliated.

Par. 106. (28) Since complete co-operation between the Boards of Agriculture and Education is essential, if the field of education is to be adequately covered and overlapping avoided, the Committee are of opinion that agricultural instruction, when provided by universities, university colleges, agricultural colleges, farm institutes and winter schools, or by means of special classes or courses of lectures in agriculture and kindred subjects (*e.g.*, dairying, horticulture), should be under the direction of the Board of Agriculture; while all instruction in agricultural subjects forming part of courses in primary, secondary or such evening schools as are in definite continuation of the education given in primary schools, should be under the Board of Education.

Par. 123. (29) In order to bring the national and local authorities into close touch with one another it might be desirable for the Board of Agriculture to appoint a consultative committee to advise on matters relating to technical and scientific instruction in agriculture.

Pars. 54-6. (30) Good educational work has been done by the national agricultural societies, but local societies have given little aid to agricultural education or research. In some foreign countries much assistance is given to educational movements by agriculturists themselves. Their societies co-operate with the State or local authority in providing teachers, itinerant experts and experimental stations. In this direction there is room for development in the work of British agricultural societies.

Par. 118. Par. 120. (31) The funds at present available for agricultural education are wholly inadequate, and considerably increased funds should be provided, the main source of which must be the National Exchequer.

Pars. 32, 120. Pars. 87, 120-1. (32) Such funds should be employed by the Board of Agriculture, first, to aid existing and projected institutions in respect of their staff and general equipment; and secondly, to aid local authorities in making provision for the agricultural work conducted by them.

Conclusion.

128. The Committee are convinced that agricultural education is of such vital importance to the United Kingdom that no effort should be spared in making the provision for it as full and complete as possible.

The ultimate aim of instruction in agriculture is to improve and to increase agricultural produce, and there is no doubt but that by a general adoption of scientific methods an important development could be effected in every branch of agriculture and in the various rural industries subsidiary to it. By this means, without diminishing the supply of meat and cereals grown in the country, a large proportion of the butter and cheese, the poultry, the fruit and vegetables (to say nothing of the timber) now imported from abroad could be remuneratively produced at home.

The possibility of additional employment as a result of improved education ought not to be overlooked. Additional employment would enable a larger population to find a living upon the land. This consideration is of high moment to the maintenance of the physical standard of the race, for the rural population has not only to replenish its own numbers, but, as a town-bred population rapidly deteriorates, to supply the ever-increasing demands of our great cities for healthy men and women workers.

129. In view of the heavy rates necessary in respect of rural elementary education, the incidence of which falls mainly on the agricultural population, it is only fair that every possible facility should, in return, be afforded for technical agricultural instruction. Nothing in our system of education should hinder any lad from seeking his life's work upon the land. On the contrary, all that is possible should be done to show him how, by the application of skilled knowledge, agriculture holds out the prospect of not only an interesting but a profitable career. A complete system of technical agricultural education is, therefore, the natural corollary to the vast sums spent on elementary education in the rural parts of the country.

It has been shown how foreign countries provide liberal facilities for agricultural education. If, therefore, in countries where the agriculturist is protected by import duties upon agricultural produce, it is still deemed expedient to assist him by a generous expenditure on technical education, it is surely no less important that an efficient system should be provided in a country like Great Britain, where, as in Denmark and in Holland, such duties are not imposed. Pars. 18-20.

130. The Committee are confident that, if their recommendations are adopted, it will be possible to build up in England and Wales, at no excessive cost and within a reasonable time, a system of scientific and practical agricultural education equal, if not superior, to that now existing in any other country.

131. The Committee desire to place on record their obligations to Mr. A. E. Brooke-Hunt and to Mr. H. L. French, their Secretary and Assistant Secretary, for the zeal and ability which they have both displayed throughout this prolonged enquiry, as well as for the efficient manner in which they have discharged the many difficult and laborious duties thereby imposed upon them.

We have the honour to be,

My Lord,

Your obedient servants,

(*Signed*) READY, *Chairman.*

BARNARD.

BELPER.

MORETON.

FRANCIS D. ACLAND.

DAVID DAVIES.

NORMAN LAMONT.

THOMAS LATHAM.

* JOHN C. MEDD.

T. H. MIDDLETON.

WM. SOMERVILLE.

H. S. STAVELEY-HILL.

A. E. BROOKE-HUNT, *Secretary.*

H. L. FRENCH, *Assistant Secretary.*

14*th July*, 1908.

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* Signed subject to the subjoined Supplementary Report.

SUPPLEMENTARY REPORT BY MR. J. C. MEDD.

I entirely agree with the conclusions and recommendations of the Committee, but certain points of vital importance, in my opinion, to the effective organisation of a national system of agricultural education have been omitted.

Intermediate Schools of Agriculture.

No system can be considered complete which makes no provision for the continuous instruction of lads from the age of 14 or 15 to 17 or 18. This gap can only be filled by the establishment of a few schools of the above type with courses extending over two or three years. Winter schools, however valuable they undoubtedly are, belong to a different category, and cannot supply the place of the intermediate school. That school is analogous to the *écoles pratiques d'agriculture de France*, of which the details have been given by M. Henry Grosjean, Inspector-General of Agriculture in France, and they suggest the lines upon which similar schools should be organised here. Professor Campbell in his evidence truly observed that there is nothing in England or Wales to compare to the middle agricultural schools, and he mentioned that some institutions in Ireland were "pretty much based upon the French type." The need for making some provision of this character between the elementary school and the advanced college was emphasised by several witnesses, and it was gratifying to learn from Mr. Jones Davies that a suggestion for satisfying this need had been made to the Carmarthenshire Chamber of Agriculture, and was well received. In the Report it is stated that "although there may be districts in which schools of this (the French) type would be appreciated, the Committee do not consider it desirable that they should be established throughout the country." This qualified statement is inadequate. No one has proposed that such schools should be universally established. The expense is too great, and they must at first be somewhat in the nature of an experiment. But, having regard to the evidence before the Committee, local authorities should, I think, be definitely recommended seriously to consider the expediency and practicability of establishing them where the conditions are favourable, and where there is likely to be a demand for them. Supply often creates a demand. Each group of counties, affiliated to or associated with a university or collegiate centre, should in time jointly organise and maintain one of these schools. It is reasonable to suppose that many farmers, who may be unable to afford the expense of a prolonged college course, would, as in other countries, value the opportunity for their sons to attend it. Both in its curriculum and equipment the Dauntsey School, West Lavington, Wilts, indicates what is required, and corresponds with the third class of institution referred to by Mr. Brooke-Hunt. If it were put wholly under the Board of Agriculture its agricultural usefulness would probably be increased, and it might serve as a model for the rest of the country.

Report, par. 47.

Carrick, 485; Hall, 1589; McCracken, 9325-8.

Campbell, 11374.

Wheeler, 6401-8; Pennant, 6619-32; Roberts, 8215-17; Simmons, 8697-8706, 8740.

Jones Davies, 8356-73.

Par. 51.

Solomon, 11456, 11474-85, 11526-39.

Brooke-Hunt, 15662b.

Phipps, 9196.

The Affiliation of Counties to Universities or Collegiate Centres, and the Submission of Schemes Annually to the Board of Agriculture.

Although the majority of counties are, upon paper, affiliated to or associated with some university or collegiate centre, the relationship between them is frequently of the slightest description. That connection must be materially strengthened, if a national system is to be gradually built up and become properly co-ordinated. The universities and colleges should be in fact what they are in name, the head and centre of the agricultural education within their respective areas. An initial step in this direction might be taken by an annual conference at the university or college of representatives from each of the affiliated counties to discuss their individual requirements, how they can be most effectually and economically satisfied, and to determine a definite scheme to cover the whole field. It is impossible for each county alone to provide all the varying types and degrees of instruction that are wanted. The cost is prohibitive. One county must supply what is lacking in another, and this can only be effected by corporate action. The schemes should then be submitted annually to the Board of Agriculture for advice and suggestions. This proposal met with the approval of many witnesses, and, without going so far as to propose that the submission of such a scheme should necessarily be a condition precedent to a grant, I consider that a recommendation urging local authorities to adopt this method should have been included. Grants should, so far as possible, be proportionate to the funds raised locally, and the Board of Agriculture should be enabled to assist any county council willing to spend money on agricultural education. In the allocation of grants to universities and collegiate centres, some regard should be paid to the number of students in regular attendance, where the subsidised institution is not mainly engaged in research, or is not actively co-operating with its affiliated counties. In one or two instances, the number of students is not commensurate with the vast expenditure in maintaining the institution.

Wood, 207-13; Gilchrist, 727-9; Childs, 3975-82; Percival, 4331-9.

Dugdale, 4963.

Blackshaw, 1755; Pennant, 6618; Roberts, 8209.

Smith, 12278.

Mannington, 2103.
See also General Index, Organisation (County Councils).

Dunstan, 1898; Wright, 10197-8; Hobhouse, 15022; Swanwick, 7662; Fitzmaurice, 7847; Eve, 12998; Brooke-Hunt, 15637.

Literature.

Ample testimony was borne to the excellence of the publications issued by the Board of Agriculture, but several witnesses stated that they had never heard of particular reports or leaflets, and there was a general agreement that all literature should be much more widely distributed than it is at present. It appears to be chiefly a matter of expense, and on that ground I consider the hands of the Board would have been strengthened in approaching the Treasury by a recommendation that all literature issued by the Board should be distributed free of cost to all agricultural and horticultural colleges and schools, farm institutes, chambers of agriculture, farmers' clubs and agricultural or horticultural societies. A resolution to that effect was passed by the Agricultural Education Committee in 1901.

See General Index, Board of Agriculture (Publications).

Acland, 2833.

The Training of Teachers.

The dearth of elementary school teachers qualified to teach rural subjects is one of the principal obstacles to the uniform improvement of rural education, and I consider that the attention of local authorities should have been specifically drawn in the recommendations to the facilities offered by the Board of Education by which certificated teachers may obtain a third year's training at some approved agricultural or horticultural college under certain conditions.

Dunstan, 1910-4; Report, par. 43; Regulations for the training of Teachers, 1908.

Rural Schools and Training Colleges.

Upon the character and quality of rural schools must depend the number of pupils fitted to profit by technical instruction in agriculture or horticulture. They are the foundation upon which the whole superstructure has to be built. It is true that work carried on under the supervision of the Board of Education did not fall within the scope of the Committee's enquiry, but it so intimately concerns the Board of Agriculture in country districts that some allusion to it would, in my opinion, have been appropriate and desirable in recognition of the efforts made by the Board of Education to bring rural schools into closer correspondence with rural needs, and in order to stimulate local authorities to supplement those efforts. The recommendations which I suggest are as follows:—

(1) That the instruction in rural elementary schools should be as practical as possible, and should be mainly based upon the natural and physical phenomena of the neighbourhood, and upon actual work done by the children themselves in garden plots adjacent to the school.

(2) That higher elementary schools, with distinctive agricultural teaching in the third year, should be organised in selected and purely agricultural districts.

(3) That it is inexpedient to attempt to combine an agricultural side with an ordinary secondary school, but that nature-study and simple experimental natural and physical science should be a prominent feature at all rural secondary schools.

(4) That in all training colleges special regard should be paid to natural science upon the lines indicated in the Prefatory Memorandum to the Regulations for the Training of Teachers, 1908.

(*Signed*) JOHN C. MEDD.

APPENDIX No. I.

A Brief Survey of the Growth of Agricultural Education from 1888-9 to 1906-7.

Prepared for the Committee, by Mr. Brooke-Hunt, a Superintending Inspector of the Board of Agriculture and Fisheries.

This memorandum is confined to the growth of agricultural education as assisted by the Board of Agriculture and deals with the period between the publication of the Report of the Paget Committee and the appointment of the present Committee.

As a result of the Report of the Departmental Committee presided over by the late Sir Richard Paget, Bart., a sum of £5,000 was placed at the disposal of the Agricultural Department of the Privy Council in 1888 for purposes of agricultural education. Owing however, to the paucity of the schools or classes capable of being aided, the total amount expended by the Agricultural Department in the year 1888-9 was only £2,930, of which £1,630 was expended on institutions in England and Wales and £1,300 on institutions in Scotland. Grants were awarded to a few permanent institutions—the grants being given largely in respect of instruction in dairying—and also to agricultural societies and other associations in aid of migratory classes in dairying, of courses of agricultural lectures and of field experiments conducted by these bodies. In view, however, of the policy eventually adopted, attention may be drawn to the fact that a grant of £200 was awarded to the University College of North Wales at Bangor, for agricultural education and instruction in dairy farming.

In 1889-90 the sum of £4,585 was expended in grants of which £2,610 was allotted to England and Wales. Dairy instruction again received the greatest aid, no less than £2,055 being expended on this class of instruction alone, including that expended through the College at Bangor, to which institution, during the year in question, a grant was made amounting to £400.

In 1890, with a view of adopting a more definite system of State aid to agricultural education than had previously been possible, the Board addressed a circular to local authorities, agricultural societies, &c., asking for detailed information, supplemental to that collected by the Departmental Committee of 1887-8, as to the extent and character of the provision made in their districts with regard to agricultural education. The replies received, however, " made it clearly apparent that, beyond the institutions already known to the Board, very few facilities for practical agricultural instruction were at that date available in Great Britain." In this year (1890-91) the Board distributed in grants £4,840, of which £2,830 was spent in England and Wales. The college at Bangor received £500, but just before the close of the financial year the example which it had set of a university college developing an agricultural department was followed by the Yorkshire college at Leeds, which received an initial grant of £50.

Report, 1890-91 [Cd. 6525], p. 3.

The department of agriculture which the college at Bangor had organised was staffed partly by specially appointed teachers, and partly by the regular scientific teachers at the college. An in-college course of instruction was provided, while stations for field demonstration and experiment, general lectures on agricultural subjects to farmers, and also to schoolmasters, and dairy schools and classes were started. Of these last-named schools three were provided, all more or less of the nature of permanent, or fixed, schools, and situated in different parts of North Wales.

The following extracts from their inspector's report on the general advantages offered by this scheme of agricultural education was published by the Board of Agriculture in their Education Report for 1890-91 :—

" Speaking generally, it may be said that sufficient experience has been gained to feel assured that the plan of concentration works well, and is one which is capable of imitation. Under no present existing system is such a complete variety of subjects placed at the immediate disposal of all classes connected with farming at such a comparatively small extra cost.

" The quality of the instruction thus offered to farmers is of an unusually high nature, since the initiative is taken by a body of specialists skilled in almost every branch of science. Moreover, under this system, the different classes of instruction, at present carried on in various other parts of the country in an unsystematised and disconnected manner are here made mutually dependent, while bearing, severally and collectively, direct relationship to the college.

" The dairy schools may be classed as the representatives of the purely technical type of instruction, and are fed by the dairy lectures. In time these schools may develop themselves and become more of the nature of farm schools, in their turn fed by the outside lectures on agriculture and the sciences allied thereto. Again, the farm school may add horticulture to its general technical curriculum, and also forestry.

" Furthermore, experimental stations for demonstration already exist, and these often serve the purpose of texts for lectures to farmers and others ; it is possible to develop these stations still more, and to connect them more closely with the technical school.

" Eventually it might be possible to have in each district the technical school, fully equipped at all points, existing as already said at the farmer's own door, capable of acting as a continual source of information and instruction for him, his sons, and his servants, and also for the local schoolmasters, but dependent for its origin and its maintenance on a body consisting of men whose lives are devoted to the pursuit of education in its most scientific and its highest aspects.

" It cannot be ignored that the key to the whole of this Bangor system is the Board of Agriculture grant. By means of it the college authorities can approach landowners and county councils, and prove to them that they have ample security that the money they give the college will be well spent, because the whole system has Government approval, and is under Government inspection ; without that, the system could not be the success which it is.

" It has been shown, however, that a most complete system of agricultural education can be organised by this college, one which will not only fulfil its own proper duties in the six northern counties of Wales, but form a type on the lines of which it may be feasible to organise systematic agricultural education throughout the kingdom.

" It certainly has this merit, apart from the intrinsic value of the instruction given, that under it local effort is called out to its utmost extent, but is at the same time systematised ; while the Imperial authority is called upon for the minimum amount of funds which can be demanded by any organised system of agricultural education."

The passing in 1890, of the Local Taxation Act introduced a new series of factors into the question of agricultural education, but after enquiry the Board came to the conclusion that the money available through county councils was being, and likely to be, used largely for local lectures, demonstrations, dairy teaching and special classes, in some instances in connection with and drawing scientific aid from, a well equipped agricultural department in a provincial college. Under these circumstances the Board determined to pursue the aim of concentrating its limited funds upon institutions whose sphere and operations partook more or less of a central character. Two new institutions of this nature came into existence (*qua* agriculture) in 1891-2, viz., the College of Science at Newcastle-on-Tyne and the University College at Aberystwyth. The total grants distributed in this year amounted to £6,705, of which England and Wales received £4,460 and Scotland £2,245, and the share which the English and Welsh colleges had in this was £2,000.

Report, 1891-2, p. 4.

In 1892-3 the collegiate centres in England and Wales providing instruction in agriculture were joined by Cambridge, where a scheme was organised in connection partly with the University and partly with adjacent counties. In 1893-4 a scheme in connection with the University College at Nottingham was started and one in connection with what was then called the University Extension College at Reading ; and the year in question perhaps demands some special remark in that the Board's grants in England and Wales were then for the first time concentrated entirely (except in one special case) upon the collegiate centres and upon certain institutions which provided dairy instruction for other

than merely local areas, and had from the outset been regarded as forming another series of proper recipients of the Board's grants. No fresh institution came into existence during the following year but in 1895–6 the Board were enabled to make a grant towards the newly started college at Wye. This institution was founded under different conditions to any previously aided by the Board, as it was not an agricultural department grafted on to an existing institution, but a college of the highest type, dealing solely with agriculture and founded entirely by the joint action of two county councils.

Attention may also be drawn to the fact that the year 1895–6 was the last in which grants were made to Scotland for purely educational purposes. At the end of this year the administration of these grants was handed over to the Scotch Education Department. Grants, however, for certain specific objects, viz., the training of working gardeners and foresters at the Royal Botanic Gardens at Edinburgh, and the conduct of a certain class of agricultural experiments and enquiries continued to be made in Scotland by the Board. Grants, for the former object, however, were only continued until 1897–8, when the responsibility for the class was transferred to Her Majesty's Office of Works.

The sums distributed in grants in the years last mentioned, viz., from 1892–3 to 1895–6 were respectively £7,425, £7,100, £7,400 and £7,850, of which England and Wales received in each year £4,850, £4,850, £5,400 and £5,850, and Scotland £2,325, £2,075, £2,000 and £2,000, the balance in the two previous years being spent on special classes for the training of dairy teachers. The grants to the English and Welsh colleges in the years in question were respectively £3,000, £3,850, £4,350 and £4,900.

In 1896–7, £6,950 was distributed in grants, of which £5,700 was allocated to the various centres, a grant of £200 being now made to one institution, in addition to the £800 which had until then been considered as the maximum grant to be allowed. This sum was allowed in respect of a farm which, though acquired by the Northumberland County Council, was placed under the scientific supervision of the College of Science at Newcastle-on-Tyne. The grants to dairy institutes, &c., amounted to £900, and £350 was allowed in respect of the above-mentioned work in Scotland.

In 1897–8 the collegiate centres received £5,900, of which £200 was in respect of the farm acquired by the University College of North Wales, Bangor. The grants in respect of dairy institutes, research, and experimental work carried out in England amounted to £900, while Scotland received £400 for experiments and the class for working foresters, making a total sum expended of £7,200. In 1898–9 this amounted to £7,350, the collegiate centres receiving £6,000 ; dairy institutes (which this year included the Midland Institute established by the action of the counties of Derby, Leicester and Nottingham) and various forms of research £1,250 ; and Scotch experiments £100. The year is notable for the fact that in it a Chair of Agriculture at the University of Cambridge was established, and, in the succeeding year, the University having organised an agricultural department took over all the work which had until then been conducted by the Cambridge and Counties Agricultural Education Committee.

In 1899–1900 the total expended in grants amounted to £7,750. A grant was made in respect of the farm at the College at Wye ; the Collegiate centres receiving altogether £6,600, the grants to dairy institutes, &c., being £1,050, and Scotch experiments receiving £100.

In 1900–1 the Yorkshire college received a grant of £200 in respect of the special work carried out at the farm acquired by the County Councils of the East and West Ridings of Yorkshire, and a change took place as regards the Nottingham centre. The work carried out at Nottingham itself had not from the beginning been altogether of a satisfactory character, and during the year under review had been entirely removed to the Midland Institute. An enlargement of the existing buildings had taken place, and arrangements been made whereby the place would be organised as a college providing not only the best class of instruction with reference to dairy farming, but also short courses of a general agricultural character. In the year in question the central collegiate institutions received £6,600, and the dairy institutions (the Midland Institute being included entirely in this heading) £1,250, making a total of £7,850 allotted to institutions for educational purposes. The purely experimental work, which had been increased by certain enquiries undertaken at the instance of the Board and on its behalf, was in this year defrayed out of a different subhead of the vote made by Parliament to the Board for these purposes.

In 1901–2 no particular change occurred, except that the grant to the Midland Agricultural and Dairy Institute was increased by £100, bringing the total expenditure on education for the year up to £7,950.

Hitherto the grants made by the Board to collegiate institutions were confined to those where work extended over an area embracing at least two counties. But in 1902–3 the Board were enabled to give some measure of financial assistance to other institutions, five in number, carrying on, for the most part, general agricultural education. Three of them were institutions whose foundation was due to county council action. These were the College of Agriculture and Horticulture at Holmes Chapel, Cheshire ; the Agricultural and Horticultural College, Uckfield, East Sussex ; and the Cumberland and Westmorland Farm School, Penrith. The two first were institutions each acting practically for a single county, where a good general course of instruction was provided, suitable for farmers' sons. The last named provided (for the two counties which supported it) dairy instruction for women in summer, and a general course of instruction for young farmers in winter. Of the remaining two to which a grant was awarded, the Harris Institute acted as a teaching agricultural institution for Lancashire, while the Harper-Adams College in Shropshire, established by private benefaction, was prepared to act not only for the county in which it was actually situate, and from which it derived a substantial grant, but also for Staffordshire, of which the county boundary was not many miles off. The grants to these institutions amounted altogether to £950, bringing the total grants awarded by the Board up to £8,900. In 1903–4 a fresh institution was aided in the shape of the National Fruit and Cider Institute, which had been founded by the joint action of the Board of Agriculture, various county councils in the West of England, and the Bath and West of England Society. Grants in respect of research into cider-making had been made by the Board to the Society for several years, but the time had arrived when it was thought that something more definite should be done in this direction, and the Board summoned a conference of representatives of those bodies interested in the subject, with the result that eventually the Institute, where operations were not to be confined to cider-making and research only but to extend also to fruit growing generally, was established.

In 1904–5 the college at Reading having acquired a farm, and that at Aberystwyth having done the same before the close of the year, grants were awarded in respect of the same, while a fresh county institution, the Technical Laboratories at Chelmsford, in Essex, where instruction was provided in agricultural and also horticultural subjects, received a grant. The grants thus made amounted to £500, and to these were added two grants of £250 each in respect of departments of forestry which, in consequence of the recommendation of a Departmental Committee on the subject, were started at two colleges (Bangor and Newcastle). The total grants for the year thus amounted to £10,200.

Some slight increase was made in the grants distributed in 1905–6, mainly by the inclusion of two fresh recipients of the Board's aid, viz., the Ridgmont Agricultural Institute in Bedfordshire, and the Hampshire Farm School at Basing, the latter being maintained by the County Council alone, and the former chiefly by the Bedfordshire County Council, but receiving small grants from other counties immediately adjacent. The total amount distributed in grants during the year amounted to £10,550.

In 1906–7 a further increase was made in the grants allotted. The Harper-Adams Agricultural College, which had acquired additional land for experimental purposes, and in respect of which the Board had received a very favourable resolution from the Shropshire Chamber of Agriculture, was awarded an additional grant of £100, and the colleges in Cheshire and East Sussex, where the respective County Councils were bearing a considerable financial burden, received additional grants of £50 each.

In addition to the above, the Board were enabled to make a grant of £800 to the Royal Veterinary College, in order to extend the teaching staff so that the college might be in a position to become a recognised school of the University of London.

The above additions brought up the total for the near to £11,550.

APPENDIX No. II.

Local Organisation of Agricultural Education.

Summary of the Replies received to a Circular Letter sent to each County Council in England and Wales, asking :—

1. Under which Committee the Direct Control of Technical and Practical Agricultural Education in the County is placed.

2. Whether this Committee Reports to another Committee (and if so, which); or whether it Reports direct to the County Council.

I. In **30** counties the control of agricultural education is placed directly under an **Agricultural Sub-Committee** which reports either to the Higher Education Sub-Committee or to the Education Committee :—

(*a*) Bedford
‡Bucks
(*b*) Cumberland
Cheshire
‡Cornwall
(*c*) Devon
‡Durham
Essex
Gloucester
Hants
Hereford
Hertford
Huntingdon
‡Lancashire
Leicester
Monmouth
Northumberland
Salop
Stafford
Suffolk, East
Suffolk, West
Sussex, East
‡Warwick
(*b*) Westmorland
Worcester
Yorkshire :—
(*d*) East Riding
(*d*) North Riding
(*d*) West Riding
Brecon
(*e*) Glamorgan.

‡ In these five counties the reports of the agricultural Sub-Committee are first received by the Higher Education Sub-Committee.

(*a*) An independent body of management called the Bedfordshire Agricultural Education Committee.

(*b*) Joint Agricultural Committee for Cumberland and Westmorland.

(*c*) Agricultural Committee, which reports direct to the County Council on non-educational matters.

(*d*) The powers and duties of the County Councils for the three Ridings with respect to the provision of technical instruction in agriculture have been delegated to the Yorkshire Council for agricultural education.

(*e*) The decisions of the Agricultural Committee involving educational expenditure have to be reported to the Secondary Education Sub-Committee or to the Education Committee; in other matters the Agricultural Committee reports direct to the County Council.

II. In **2** counties the control of agricultural education is placed directly under an **Agricultural Committee,** which reports direct to the County Council :—

Somerset
Wilts.

III. In **4** counties the control of agricultural education is in the hands of a **Joint Committee** in each county consisting of representatives of the **County Council** and of the **Agricultural Department of the University College of North Wales, Bangor;** the reports of the Joint Committee are received direct by the County Council in

Anglesey
Carnarvon
Denbigh

and by the Technical Education Committee in

Flint.

IV. In **25** counties the control of agricultural education, where any is provided, is placed directly under either the **Higher** or **Technical** (**not** Agricultural) **Sub-Committee** or the **Education Committee** itself :—

Berks
Cambridge
Isle of Ely
*Derby
Dorset
Isle of Wight
†Kent
Lincoln :—
Holland
Kesteven
*Lindsey
Middlesex
Norfolk
Northampton
Soke of Peterboro'
*Notts
Oxford
Rutland
†Surrey
Sussex, West
Cardigan
Carmarthen
Merioneth
Montgomery
Pembroke
Radnor.

* The Governing body of the Midland Agricultural and Dairy College organise and direct the principal part of the work of agricultural education within the area of these counties.

† These counties established and maintain the South-Eastern Agricultural College, Wye, through which the work in the counties is partially conducted.

APPENDIX No. III.

WINTER AGRICULTURAL SCHOOLS.

The following particulars respecting winter agricultural schools in Holland, Denmark and Germany have been extracted from the current prospectuses of the institutions named. For information on the work of these schools and for advice in selecting typical institutions, the Committee are indebted to Mr. C. Roest, Deputy Director-General of Agriculture, Holland; Professor W. Johannsen, The University, Copenhagen; and Professor F. Falke, The University, Leipsic.

WINTER SCHOOLS OF HOLLAND.

The session at winter schools lasts from 5½ to 6 months, between October and April, the actual time of beginning and closing varies with the earliness or lateness of the season. The full course consists of two winter sessions. Little use is made of the rooms of the winter schools in the summer months. In some schools, however, courses are given on Saturdays for the training of teachers for winter courses. It is now proposed to use the school buildings in summer for giving courses of domestic economy to the female agricultural population.

The majority of the students have previously attended an elementary school only, but some have had a more advanced education.

The age of the 170 students at the winter schools in the winter 1905–6, varied as follows:—4 were 15 years old, 26 were 16, 63 were 17, 39 were 18, 17 were 19, 8 were 20, and 13 were older.

There are six winter schools and the number of teachers varies from five to eight, viz.:—

School.	No. of Teachers.
Groningen	8
Leeuwarden	5
Schagen	7
Dordrecht	5
Goes	6
Sittard	6

The following table shows the subjects of study at the winter schools and also the number of hours per week devoted to each subject:—

Subjects.	Groningen.		Leeuwarden.		Schagen.		Dordrecht.		Goes.		Sittard.	
	Class.		Class.		Class.		Class.		Class.		Class.	
	1st.	2nd.	1st.	2nd	1st.	2nd.	1st.	2nd.	1st.	2nd.	1st.	2nd.
Knowledge of the soil, soil-working and improvements	2	2	2	2	2	2	3	2	2	2	1	1
Principles of manuring	0* 2†	4* 2†	—	3	—	2	—	3	—	3	1	2
Culture of different crops	3* 2†	1* 2†	2	2	2	2	2	3	3	2	2	2
Stockbreeding and veterinary hygiene	5	5	5	4	4	5	5	4	4	3	4	4
Feeding of stock	1	1	—	2	1	2	—	2	1	2	2	2
Dairying	1	2	2	2	2	2	2	2	2	2	2	2
Agricultural economics and book-keeping	—	3	1	2	1	2	—	2	—	1	—	1
Chemistry	4* 3†	1* 2†	2	2	4	2	2	3	2	2	2	2
Botany	2	1	2	2	2	1	2	2	2	2	2	1
Zoology	2	2	2	2	2	1	2	2	2	2	1	2
Physics	2	1	3	1	2	2	2	2	2	1	2	2
Dutch	1	1	2	—	2	1	2	—	1	1	2	2
Mathematics	2	1	2	1	2	2	2	—	2	1	3	2
Fruit-growing	—	—	—	—	1	1	—	—	1	1	1	1
Market gardening	—	—	—	—	1	1	—	—	—	—	—	—
	25	25	25	25	28	28	24	27	24	25	25	26

* Number of hours weekly *up to* the New Year.

† Number of hours weekly *after* the New Year.

EXTRACTS FROM THE PROSPECTUS OF THE WINTER SCHOOL AT GRONINGEN FOR THE SESSION 1907–08.

Staff.

The staff of this school consists of eight teachers.

The director teaches agriculture; there are two teachers for live stock, one for dairying, one for manuring, one zoologist, one teacher for the Dutch language and one for chemistry, physics and arithmetic.

The Managing Committee, the chairman of which is the Burgomaster of Groningen, consists of 10 persons, of whom five are practical agriculturists, and one a former teacher of agriculture.

Syllabus of Instruction.

SOILS.

CLASS I. (Two hours a week.)

Knowledge of the Soil.—The atmosphere. Relation between atmosphere and soil. Origin and composition of soil. Analysis of soil. Physical and chemical properties, *e.g.*, absorption of water, rising of water by capillarity, evaporation, heating, absorption of gases. Importance of humus in the soil. Absorption of substances by plants.

CLASS II. (Two hours a week.)

Repetition of the above. Different varieties of soils. Valuation of the soil.

Working of the Soil.—Effect of treating the soil. Physical properties of arable land. Influence of natural powers thereon. Ploughing, harrowing, rolling. Implements used for this purpose.

Improvement of Soil.—Draining. Irrigation. Methods of carrying out the operations.

Principles of Manuring.

Class I. (After the New Year, two hours per week.)

Short review of the nutrition of plants. Liebig's law of the minimum; the factors which influence the method of manuring.

Manures—Different kinds and how they are classified.

Class II. (Before the New Year, four hours a week; after the New Year, two hours a week.)

Farmyard manure—composition, treatment, preservation and use.

Other natural manures—sewage (treated town sewage), composts.

Artificial manures—composition, origin, manufacture, method of use, control.

Indirect manures.

Green manuring.

Repetition.

Crops.

Class I. (Before the New Year, three hours a week; after the New Year, two hours a week.)

General.—The seed: structure, germination, germinating power and properties. Influence of the size of the seed and root on the produce. Rotations. Change of seed. Space required. Sowing: methods, time and depth of sowing. Implements used.

Treatment of the plant. Protection from frost, drought and excess of water.

Class II. (Before the New Year, two hours a week; after the New Year, three hours a week.)

Treatment of the plant (*contd*). Protection from weeds and diseases. Earthing up. Hoeing. Harvesting. Preservation of the produce. Implements used.

As far as possible the principal crops are dealt with separately.

Live Stock.

Class I. (Five hours a week.)

Anatomy and mode of life of the larger domestic animals, chiefly horses and cattle. The aim of the instruction is to teach in rough outline the structure and uses of the various parts of the body; the method of digesting various feeding stuffs receives careful attention.

Description of the various breeds of horses. Knowledge of the external appearance and the characteristics of the different breeds of horses, special attention being given to the Dutch breeds and those used or recommended for crossing with the Dutch breeds.

Lectures on this subject are illustrated by means of pictures and the living horse.

Class II. (Five hours a week.)

Description of the various breeds of cattle, sheep and pigs. Obstetrics. The housing of stock.

Knowledge of the external appearance and the characteristics of the different breeds of cattle, sheep and pigs, special attention being given to the Dutch breeds and those used or recommended for crossing with the Dutch breeds.

Lectures on this subject are illustrated by means of pictures and living animals.

Breeding.—Rules to be considered. Different methods followed. The way in which the best races have been obtained. How cattle breeding is carried on in Holland and in what directions improvements might be affected.

Sanitation and Hygiene.—Conditions of health. Arrangement of buildings. Nursing of animals. Knowledge of the laws with regard to contagious diseases and to defects which annul sales in the cattle trade.

In addition, horse-shoeing is dealt with briefly.

Feeding.

Class I. (One hour a week.)

The importance of feeding. The chemical constituents of the animal body, and of food.

Class II. (One hour a week.)

The chemical constituents of food (*contd.*) Digestibility of food. Preparation of food. Comparative value of certain foods. Rations. Some foods and their properties.

Dairying.

Class I. (One hour a week.)

Composition and properties of milk and its constituents. Bacteria, conditions under which they can live and can be combated.

Short review of dairying according to old systems. Development of mechanical processes.

Class II. (Two hours a week.)

The origin of milk. Milking. Treatment of milk on the farm. Conveyance to the factory. Reception. Measuring and weighing. Sampling. Testing.

Treatment of cream, pasteurising, cooling, acidity, pure cultures. Churning. Working, salting, packing and despatching of butter. Faulty butter. Usual methods of making cheese. Various kinds of cheese, specially those made in Holland. Sale of milk.

Economics.

Class II. (Two hours a week.)

Industry: Soil, capital and labour. Especially in relation to agriculture, horticulture, and the fattening and breeding of cattle. Improvement of the soil from the point of view of rent. Capital value of buildings. Valuations. Different systems of agriculture.

Agricultural Book-keeping.

Class II. (One hour a week.)

Arrangement of a system of book-keeping suitable for farming.

Chemistry.

Class I. (Before the New Year four hours a week.)
(After the New Year three hours a week.)

Introduction. The chief elements and their principal combinations, those of importance in agriculture being dealt with in greater detail.

Class II.

The chief metals and their principal combinations, in continuation of Class I.

The principal groups of carbon compounds. Agricultural technology (manufacture of starch, sugar and alcohol).

Physics.

Class I. (Two hours a week.)

Properties of solids, fluids and gases. Heat.

Class II.

Heat (*contd.*) General account of matter and forces. Principles of the steam engine. Elements of meteorology; also, if possible, electricity.

The above subjects are all treated from the point of view of agriculture.

Botany.

Class I. (Two hours a week.)

External and internal structure of plants. The life of the plant.

Class II. (One hour a week.)

Classification of plants. Discussion of certain of the lower plants from the point of view of plant and live stock diseases (bacteria, potato disease, rust).

Description of grasses and weeds.

Zoology.

Class I. (Two hours a week.)

Explanation of the structure and of the mode of life of mammals in general.

Description of the more common species useful or injurious to agriculture.

Class II. (Two hours a week.)

The structure of the lower groups of the animal kingdom.

Description of the more common species useful or injurious to agriculture.

DUTCH LANGUAGE.

CLASS I.

Exercises in language and style. Reading.

MATHEMATICS.

CLASS I. (Three hours a week.)

Arithmetic, algebra and Euclid, as far as possible in connection with agriculture.
Surveying and mensuration.

CLASS II. (One hour a week.)
Continuation of the work of Class I.
Geometry.

WINTER COURSES AT AGRICULTURAL SCHOOLS IN DENMARK.

The agricultural schools in Denmark are usually owned by the director or principal of the school. The combined subvention received by each school from the State and local authority averages £210 per annum.

The principal course of instruction held at an agricultural school is the agricultural course held in the winter. This course usually begins on the 2nd or 3rd of November and lasts for five or six months. At certain schools there is a supplementary course in agriculture lasting for a further three months. Some of the schools also provide courses during the summer months for dairy managers and dairymaids.

The majority of the students attending the agricultural courses are the sons of farmers occupying farms of from 40 to 60 acres, the remainder being the sons of smaller farmers or cottagers. The students must be over 18 years of age, must have attended a people's high school and have had practical experience of farming, the instruction given being of a purely theoretical character.

As a rule the fees charged each month become less as the course progresses; for example, at Ladelund the fees for tuition, full board and residence are for the first, second, third, fourth and fifth month, 47, 42, 37, 32 and 27 Kr. respectively, the total fees for the five months' course being 185 Kr. (£9 15s.) The fees at Ladelund are typical of those charged at other agricultural schools.

The following are particulars of three typical schools :—

I. The *Tune Landboskole*, founded in 1866, is one of the most advanced schools of this type in the country. Being owned by a private company it is an exception to the general rule. A farm of 43 acres belongs to the school and a further 23 acres is rented. The winter course, lasting for six months, is, on the average, attended by about 60 students. The staff consists of six teachers.

The curriculum includes the following subjects :—

Danish history, literature, arithmetic, geometry, book-keeping, surveying;
Chemistry, physics, anatomy, geology, botany;
Agriculture (including manuring, crops and plant cultivation), animal physiology, management of live stock, agricultural history; and

Gymnastics.

II. The new agricultural school at *Hong* represents a less advanced type of school. It was founded in 1903, having grown out of the neighbouring high school. For a few years it had, in addition to the winter agricultural course, a supplementary course lasting for a further three months, but this has been abandoned as it was found that students generally desired to return to their farms at seed-time. The number of students attending the course lasting from 3rd November to April, has averaged 50. The staff consists of five teachers.

The subjects taught are as follows :—

Danish, Danish history, arithmetic, chemistry, physics, botany;
Drawing and surveying, agricultural book-keeping, soils, the rotation and manuring of crops, management of live stock, poultry-keeping, production and treatment of milk; and

Gymnastics.

III. The *Ladelunde Landbrugsksole*, established in 1879, is an institution of considerable importance, for, in addition to training some 250 students annually, it has extensive laboratories and conducts much other work, for example, the analysis of fertilisers and feeding stuffs.

The school is managed by the owner; and the staff is composed of ten teachers, one of whom is a veterinary surgeon, and one an engineer. The farm consists of 80 acres owned by the director. The agricultural course lasts for five months, is usually attended by about 100 students, and embraces the following subjects of study :—

Subject.	Time devoted to each.
Danish	60 hours during the course.
Arithmetic	60 ,, ,, ,, ,,
Chemistry	70 ,, ,, ,, ,,
Physics	70 ,, ,, ,, ,,
Botany	10 ,, ,, ,, ,,
Geology	8 ,, ,, ,, ,,
Drawing	20 ,, ,, ,, ,,
Agricultural history	15 ,, ,, ,, ,,
National economy	12 ,, ,, ,, ,,
Surveying	20 ,, ,, ,, ,,
Agriculture (including rotation and manuring, soils, plant cultivation, plant diseases and moor culture ..	150 ,, ,, ,, ,,
Bacteriology	15 ,, ,, ,, ,,
Dairy work	12 ,, ,, ,, ,,
Management of live stock and poultry	180 ,, ,, ,, ,,
Book-keeping ..	30 ,, ,, ,, ,,
Machinery and Implements	18 ,, ,, ,, ,,
Gymnastics	1 hour daily.

WINTER SCHOOLS IN GERMANY.

The German winter schools are intended for young persons unable to attend the ordinary agricultural schools. They are open, as their name implies, during the period when farm work is partially suspended. The course generally extends through two winters. The following particulars of three Winter Schools in Saxony may be regarded as typical of the rest :—

The *Freiberg Winter School*, founded in the year 1876 by the Dresden Agricultural Society, is under the supervision of the Ministry of the Interior but the Society appoints the Director. The aim of the school is to supply technical instruction, in as short a time as possible, to young persons desiring further instruction but unable to leave the farm for any considerable period.

The instruction goes beyond that supplied in the people's schools, but does not include higher agricultural education. The course extends through two winters. There are two separate classes, and the lower form is intended for young farm people whose education is, at least, of the standard of the people's schools. The upper class includes pupils who have passed through the lower form as well as other scholars who have passed a satisfactory examination.

The fees are 40 marks (£2) for each winter half-year course, one-half payable on joining and the balance at the beginning of the following January. New students pay an entrance fee of 10 marks. Board and lodging with families cost from 25 to 40 marks per month. The Director recommends suitable families, and residence at inns is forbidden.

The *Auerbach Winter School*, founded also in 1876, is under the Ministry of the Interior. The course extends over two winter terms, generally from the 1st November to Easter. The period of study thereby enables the pupils to help at the farm during the summer. The school also permits students of a comparatively advanced age, who possess a sufficient elementary knowledge of agriculture, to enter the upper class. There is a marked dividing line between the two classes of instruction and it is really necessary that pupils should pass through both classes in order that the objects of the school may be fully attained.

In the lower class instruction is given in elementary subjects. The principles of nature study are especially taught, whilst agricultural instruction follows in the upper class. The curriculum includes the following subjects :—

(1) *General Instruction.* —German, arithmetic, geometry, drawing, geography and history with special reference to agriculture.

(2) *Science.*—Meteorology, chemistry, geology, botany and zoology.

(3) *Special Subjects.*—Agriculture, including instruction in manuring, cultivation of plants (especially horticulture), animal industry (especially dairying, horse-shoeing and veterinary subjects), political economy and commercial subjects (especially insurance and co-operation and book-keeping).

A collection of specimens is provided and an extensive school garden is used for various experiments. Besides the ordinary instruction (about 34 hours per week), evening classes are provided for local students under the superintendence of competent teachers. A students' club provides for agricultural essays, debates and demonstrations. Religious instruction is also given and the assistance and support of parents and guardians are invited in this connection.

Practical instruction is provided in manual work, such as carpentering, wheel-making, saddlery, metal-work, card-board work, basket-making, plaiting and wire-work. These classes are not obligatory, and a fee of 10 marks per winter term is charged for use of materials.

The fees are 40 marks (£2) per winter session for natives of Saxony and 60 marks (£3) for others. There is no entrance fee. Non-local pupils board and lodge with respectable families, the cost being from 35 to 45 marks per month. The Director of the school, who also takes boarders, desires to be consulted as regards the selection of families as the authorities wish to ensure that the household is suitable. The average total expenses per winter session are as follows:—Board and lodging, 200 marks; books, 30 marks; fees, 40 marks; pocket money, 50 marks; total, 320 marks (£16). Endowments exist for needy students.

Pupils who have attended regularly during one winter course are exempted from attendance at the Continuation School (*Fortbildungschule*) during the following summer, and they are permanently exempted from doing so if they complete the winter school course with satisfactory results.

Pegau Winter School.—The prospectus states that the object of the school is to train the young agriculturist to meet modern requirements, and to help to remedy the tendency of boys to follow blindly in their father's footsteps in agricultural matters. In order to free the young mind from stereotyped methods "the why and wherefore" are taught. The school is intended to complete the instruction obtained in the elementary school, to apply practically knowledge which primary education does not supply, and more especially to give instruction in natural science which is so indispensable to young people whose work keeps them constantly in touch with nature.

The governing body of a winter school is generally composed of leading local officials and landowners. The governors of the Freiberg school, for instance, include a local squire, two other landowners, a mayor, a farmer, the secretary of the local agricultural council and the director of the school.

The staff of the Freiberg school consists of the director, who is also professor of agriculture, a lecturer on agriculture, who is the cattle inspector of the Dresden agricultural society; a professor of the German language, who is professor at the local high school; a lecturer on botany and zoology, who is also a professor at the gymnasium; the veterinary lecturer is a district veterinary surgeon, and the teachers of drawing, geometry, and land surveying, gymnastics, history, geography, arithmetic, &c., are masters at primary schools.

The number and designation of students at Freiberg in 1906-7 are indicated in the following table:—

	Lower Class.	Upper Class.
Ordinary students	32	35
External students	—	4
Total	32	39
Sons of agriculturists:		
Ordinary students	24	26
External students	—	3
Sons of non-agriculturists:		
Ordinary students	8	9
External students	—	1

	Lower Class.	Upper Class.
Average age of students:	yr. m.	yr. m.
Ordinary students	15 0	16 2½
External students	—	22 3

The subjects and time-table of the Freiberg school are indicated below:—

	Lower Class. Hours.	Upper Class. Hours.
General subjects:		
German	4	4
Writing	2	—
Arithmetic	3	1
Geometry	2	2
Geography and History	2	2
Drawing	2	1
Geometrical Drawing and Surveying	2	2
Gymnastics	1	1
Singing	1	1
	19	14
Science:		
Botany	3	—
Zoology	3	—
Physics	3	2
Chemistry and Mineralogy	8	2
	17	4
Agricultural subjects:		
Agriculture	—	5
Horticulture	—	1
Animal industry	—	4
Political economy and commerce	—	3
Management	—	1
Book-keeping	—	2
Agricultural calculation	—	2
Horse-shoeing, pathology	—	1
Total	36	37

Practical instruction is also given by means of excursions to farms and estates in the neighbourhood, and the students of the upper class obtain additional technical instruction by visits to the Dresden slaughter house and Veterinary High School.

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Shri Brihad Bhartiya Samaj

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ENGLAND AND WALES.
1907.

Institutions in receipt of aid from the Board of Agriculture and Fisheries.

I.—Collegiate Centres and Counties acting in connection with them.

(a) Universities and University Colleges.

1. Armstrong College, Newcastle on Tyne.
2. Leeds University.
3. Cambridge University.
4. University College, Reading.
5. University College of N. Wales, Bangor.
6. University College of Wales, Aberystwyth.

(b) Agricultural Colleges.

7. Midland Agricultural & Dairy College, Kingston.
8. South Eastern Agricultural College, Wye.
9. Harper Adams Agric. College, Newport, Salop.

Groups of Counties acting in connection with each Collegiate Centre are coloured plain and bounded by thick black lines.

II.—Institutions acting for a single County.

(c) Agricultural Colleges, Institutions, &c.

10. Cumberland and Westmorland Farm School, Penrith (2 Counties).
11. Chelmsford Technical Laboratories.
12. Ridgmont Agricultural Institute (Beds).
13. Agricultural, &c., College, Uckfield, (E. Sussex).
14. Basing Farm School, Hampshire.
15. College of Agriculture, &c., Holmes Chapel.
16. Harris' Institute, Preston, Lancashire.

III.—Special Institutions.

17. Eastern Counties Dairy Institute, Ipswich.
18. British Dairy Institute, Reading.
19. National Fruit and Cider Institute, Bristol.
20. Royal Veterinary College, London.

Counties maintaining within their area institutions of their own are indicated by thin red lines, whether County acts in connection with a centre or not.

Institutions not in receipt of aid from the Board of Agriculture and Fisheries.

21 Oxford University.

22 Manchester University.

23 Birmingham University.

24 University College, Bristol.

25 Royal Agric. College, Cirencester.

26 Agricultural College, Aspatria.

27 Cheshire County Dairy School, Worleston, (near Crewe).

28 Lancashire County Dairy School, Hutton (near Preston).

29 Gloucester County Dairy School, Gloucester.

30 Horticultural College, Studley, Warwickshire.

31 Horticultural College, Swanley, Kent.

Ordnance Survey, Southampton.